

Municipal Journal

Volume XL.

NEW YORK, MAY 11, 1916

No. 19



NIGHT VIEW OF GRAND AVE. DENSE TREES, 15-FOOT UNITS 120 FEET APART.

MILWAUKEE'S NEW MUNICIPAL STREET LIGHTING SYSTEM

To Secure Uniform Illumination by Use of Reflectors, Considerable Elevation of Lamps, and Systematic Spacing—More than Three Times as Much Light for Forty-Two Per Cent More Annual Expenditure

By F. H. BERNHARD.

The city of Milwaukee, Wis., has completed during the past winter the first section of a new street lighting system which embodies distinctive features of exceptional interest to municipal authorities. At the city election on April 4 the voters approved the plan for installation of the system throughout the city and authorized an issue of \$750,000 in bonds to permit doing most of the work this year; the remainder of the work, involving an additional expenditure of about \$500,000, will be done in 1917. When the entire system is completed Milwaukee will be the best lighted city of its size in the country. It will have a system designed for economical operation, permanence, attractiveness, and for providing street illumination of a character as near to the scientific ideal as practical limitations permit.

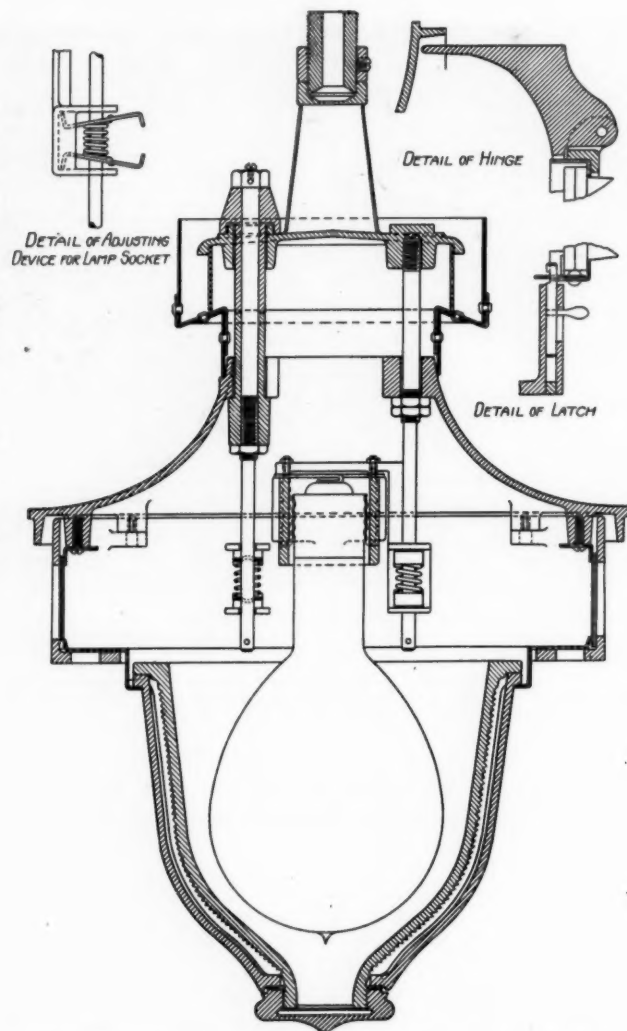
Street lighting in Milwaukee has heretofore been done almost exclusively by contract with the lighting companies, and the city has owned no part of the equipment. Practically all the lamps in use were of obsolete and inefficient types. Several square miles in the outskirts of the city were not lighted at all. There was scarcely any street in the city, even in the downtown portion, where the lighting was adequate. For many years no extensions or improvements had been made in street lighting, despite the need therefor caused by the rapid growth of the city. In 1915 the population was officially given as 428,062, a gain of nearly 15 per cent in the preceding five years.

The area of the city is close to 37 square miles, and it has about 600 miles of streets. For lighting them there were in use 271 gasoline lamps, 3,157 gas lamps, 1,294 enclosed arc lamps, 935 open arcs and 89 luminous arcs, making a total of 5,746 lamps. Less than 2 per cent of this number were of relatively modern and efficient types.

For several years the building of a municipal electric street lighting plant was urged as a solution of the problem, but many difficulties prevented consummation of the project. In 1914 it was decided to make a study of the actual requirements of a modern lighting system, and a street lighting survey was ordered by the City Council. The survey that was made was one of the most comprehensive ever undertaken on the subject. It included not only an investigation of how much light was needed on each street and the best means for providing it efficiently, but a general analysis of the scientific principles of street illumination, including a study of the objects to be accomplished and the best illuminating methods for meeting the various requirements. To make the survey and prepare the report on it required exactly one year.

The report stated that it was impracticable to utilize any of the equipment then in use and recommended that there should be provided an entirely new system, to be installed and owned by the city, and designed to furnish uniform illumination of the streets to intensities commensurate with the traffic needs. Plans for a system covering

the entire city were submitted, also designs for posts and fixtures, circuit routings, etc. Out of a total of 9,344 lamps, it was recommended that 7,322 be electric incandescent and 2,022 gas mantle lamps, the posts and fixtures for the latter to be so arranged that they could easily be changed to electric in case the city built its proposed electric generating plant at any time in the future. In the meantime it was recommended that gas and electricity be purchased on five-year contracts.



SECTIONAL ELEVATION OF ELECTRIC FIXTURE.

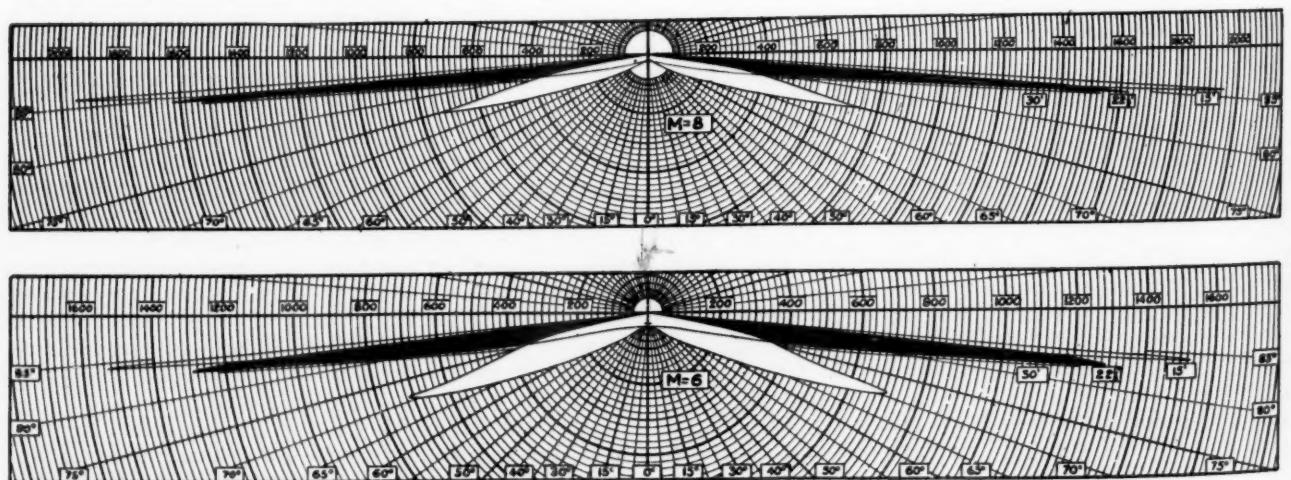
After considering the report the City Council in September, 1915, ordered a demonstration installation of the new system made and appropriated \$34,000 for this purpose. The primary object was to enable the citizens to obtain a good idea of the kind of equipment and illumination proposed, as a guide in the referendum vote on the bond issue for extension of the system throughout the city. The installation work was carried on during the late fall and winter and completed in February. The impression created by this demonstration installation was so favorable as to carry the bond issue by a large majority.

In this initial installation there are 176 lighting units with 192 lamps. About eight miles of streets have been equipped. With the exception of a few minor details, the installation was made on identically the same general plan that is to be followed throughout the city.

Probably the most important feature of the new system is that it is designed, when fully completed, to furnish uniform illumination on each street; this means that the space midway between lighting units will be as brightly illuminated as the space directly below or near each lamp, something that has been accomplished in street lighting practice in but few cases and then at comparatively high cost. Uniform illumination has been found greatly superior to the very non-uniform illumination commonly met with, and is the only kind that fully satisfies all of the objects of street lighting. This uniformity, which approaches that of the most perfect moonlight, is obtained in the new system by a scientific selection of lamps, fix-



SPECIAL 11-INCH REFRACTOR GLOBE.



PROTOTYPE CURVES FOR $M = 8$ AND $M = 6$. WHITE ARC A SHOWS LIGHT DISTRIBUTION REQUIRED FOR UNIFORM HORIZONTAL ILLUMINATION, BLACK AREA FOR UNIFORM VERTICAL ILLUMINATION.

The three cuts on this page are furnished by courtesy of the Electrical Review and Western Electrician.

tures, mounting heights and spacings, and particularly by use of a specially designed refracting globe, which reduces the illumination below and near the lamps and increases it between units.

Another important element in the general plan is the mounting of the lamps as high above street surface as practicable. This is principally in order to reduce to a minimum the glare and blinding effect of powerful lamps, since it has been found that bright rays striking the eye within the angle of 25 degrees from the horizontal produce marked discomfort and impairment of visual power. Trees offer the chief hindrance to high mounting. In Milwaukee the city forester decided that 15 feet was the greatest mounting height practicable for post units along forested streets. This was chosen as the height for about 40 per cent of all units and is used in residence streets and most boulevards. For practically all secondary business streets and those streets in which trees were not numerous the height chosen was $22\frac{1}{2}$ ft.; over half of the units are to be in this class. On the streets of the main business district a height of 30 ft. was chosen. In a few special squares posts of 45 ft. mounting height will be used. The heights given are from street surface to the center of the filament or mantle. The heights of 30 and 45 ft. are new in this country.

In determining spacings it was found that when the ratio of spacing distance (measured along the axis of the street) to mounting height was equal to 8, it was possible with a refractor globe to secure the desired uniformity of illumination. Even more perfect uniformity could be secured when this ratio (designated by M) was 6. In residence districts as close an approximation at uniformity as would satisfy the eye could be secured when $M=12$. For downtown streets, therefore, $M=6$ was used and the units are 30×6 or 180 ft. apart. For other important thoroughfares and secondary business streets $M=8$ was used and the units are mostly $22\frac{1}{2} \times 8$ or 180 ft. apart. On a few forested boulevards the same ratio is used, the units being 15×8 or 120 ft. apart. On most residence streets with light traffic the ratio $M=12$ is used, with



NEW $22\frac{1}{2}$ -FOOT SUSPENSION UNIT CONTRASTED WITH OLD OPEN ARC.

units 15×12 or 180 ft. apart; in the sparsely settled and unpaved outlying streets the spacing is $22\frac{1}{2} \times 12$ or 270 ft. By means of an adjustable socket, the lamp bulb is raised or lowered in the refractor to secure the distribution required for these different ratios.

Where lamps are put on both sides of the street, they are placed directly opposite, this making a more pleasing arrangement than the customary staggered plan; the latter was followed on one street without appreciably improved uniformity, since the latter is taken care of by the refractors. On forested residence streets a lamp is suspended directly over each street intersection and ad-



VIEW IN TWELFTH ST., SHOWING 22.5-FOOT SINGLE-BRACKET POSTS AND FORMER LIGHTING ARCHES STILL IN PLACE.



15-FOOT HARP TYPE POST.



30-FOOT DOUBLE BRACKET POST.

ditional lamps are placed between intersections, usually on one side only, because this gives satisfactory uniformity on both sides.

At least 72 per cent, and possibly nearly all, of the lighting units throughout the city will be supported by reinforced concrete posts. Permanence combined with low initial and maintenance costs were the chief features that secured the adoption of concrete. All posts but those for the suspension units are of artistic designs, in the selection of which local architects co-operated. The 15-ft. post is surmounted by a cast iron harp or yoke which bears the lamp fixture. The 22½ and 30-ft. posts have either one or two brackets; the 45-ft. posts will have either two or four brackets. These brackets are also made of concrete, separately molded and mounted on the posts after the latter are set in place.

All but a few of the concrete posts already installed are, and all that are to be added will be, of tubular form made by a new process developed by the Universal Concrete Products Company, of Milwaukee. In this process a group of high-carbon steel reinforcing rods, which are protected against buckling or displacement by being bound together in cage form, are first placed in the mold, which is then half filled with quite fluid concrete, sealed and placed in a machine that revolves the mold at considerable speed until initial set takes place in the concrete. By centrifugal action the concrete is made very dense and homogeneous; all voids are eliminated and a perfect bond is obtained about the reinforcing rods. The surplus water in the concrete is squeezed out into the hollow core and run off; this enables the post to set very rapidly. The post or pole weighs only one-half as much as a solid pole of similar outside dimensions. The strongest concrete is at the outside of the post, where it is subjected to the greatest tension and compression. This process and the machinery for it are covered by patents. There is very little hand work about the entire production of the posts. It is said that posts or poles up to 75 ft. in length can be made by this process.

These posts have been found to be very strong. Posts only four days old have been picked up by a crane with a single sling without producing any cracks or appreciable deflection. A number of the 30-ft. posts weighing 1,500 pounds were hauled from the factory about two miles to the point of erection on an ordinary lumber wagon when only four days old and set in place the next day without any evidence of weakness. All of the 135 concrete posts in the demonstration installation were molded and erected during the winter when the temperature often was below zero.

Erection of the posts was not particularly difficult. A concrete socket was first poured in the pit where the post was to be placed and into this, when set, the butt or base extension was lowered, the post being lifted by a portable derrick. Cement grout was used to seal the joint between the butt and socket.

Steel tubular poles have been used for suspension units at certain street intersections. These suspension units are supported from the middle of a well stretched steel messenger wire. The lead-covered duplex cable feeding the lamp is held close to this messenger and passes down one of the poles to the underground circuit. There are no dangling feed wires nor mast arms, as was the case in the old system. These lamps, as in fact all others in the new system except those on 45-ft. posts, are reached for cleaning and renewal by means of an extensible tower wagon.

A single type of attractive lamp fixture, specially designed and patented for the city of Milwaukee, is used throughout the system. From external appearance it is

impossible to distinguish whether it contains an electric or gas lamp. Below the hood are 8 translucent glass panels, which may be used for street names. The fixture is well ventilated, the inlets and outlets being screened to prevent entrance of insects attracted by the light. The refractor globe can be swung down for cleaning and to give access to the lamp. The refractor consists of two telescoping globes closely fitted together to form a sealed unit; the inner globe has horizontal prisms on its outer surface and the outer globe has vertical prisms on its inner surface, both prismatic surfaces being therefore protected from dust. The exposed surfaces are smooth and easily cleaned. The form and size of these refractors were specially designed for this installation; 8-inch and 11-inch sizes are used.

All electric lamps used throughout the new system are of the type known as nitrogen-filled tungsten-filament incandescent lamps, which have come into extensive use during the last two years because of their high efficiency (about ½ watt per candlepower) and generally good performance. These lamps have a guaranteed average life of 1,000 hours and actually average over 1,300 hours. This necessitates about three lamp renewals per year of 4,000 scheduled hours of burning. These lamp renewals and monthly cleanings are all the attention they require, in great contrast to the frequent trimming of arc lamps. The sizes of electric lamps used are 100, 250, 400, 600 and 1,000 candle-power.

Gas lamps are of an improved inverted-mantle type, which was specially designed for the Milwaukee system. A new type of Welsbach burner was developed to be particularly suitable for the Milwaukee fixture. It consumes 4 cu. ft. of gas per hour; the pilot flame used for lighting consumes 1/3 cu. ft. per hour and is always burning. These new gas lamps are said to be superior to any other gas units ever used for street lighting in this country. On account of the relatively rapid depreciation of gas mantles, those used have initially 110 candle-power and an average of 100 c. p. during life. This is the only size of gas lamp used and it is employed exclusively on the 15-ft. posts interchangeably with 100-c. p. electric lamps similarly mounted. The gas lamps are used between street intersections on forested residence streets, with electric suspension units at the crossings.

The use of gas lamps for this purpose has three advantages. First, it reduces the initial cost of the system. Installation cost of a gas unit is \$64, compared with \$155.35 for the corresponding electric unit, together with the proportional part of the feeding circuit; cost of energy and maintenance is higher with gas than electric lamps, however, so that the total annual cost of the former is \$25.60, compared with \$24.80. Second, use of gas along with electric lamps is also advantageous in that, should one set of these fail, the other will still provide fairly good light on the street and at least not leave it in total darkness. Finally, use of gas and electric lamps interchangeably gives the city greater assurance of securing reasonable rates for the supply of both gas and electricity from the utility companies than would be the case were one kind of service used exclusively. In Milwaukee the possibility of the city building its own generating plant is a further deterrent against excessive rates.

(To be continued.)

REPAIRING FLOOD DAMAGES AT SAN DIEGO.

The damage done to the streets and waterworks system of San Diego by the floods of January were referred to in our issue of March 9th. Since then repairs have been actively under way. Six pile trestle bridges have been reconstructed and repairs made on three others

which had been badly damaged. Eight thousand feet of wood stave pipe was placed in March to bring water from the mountains to the distributing reservoir. The 32-inch steel pipe across the Sweetwater river has been repaired, practically all of it having been re-riveted. Plans are under way for the reconstruction of the Lower Otay dam. Nine miles of washed out telephone line is being rebuilt.

SEGMENTAL SEWER IN OAKDALE

Building Fifty-seven Inch Sewer on a Curve With a Twenty-foot Radius—Method of Handling Wet Ground—Junctions and Manholes

BY G. D. CRAIN, JR.

Oakdale, an incorporated suburb of Louisville, Ky., lying immediately south of that city, constructed, in the latter half of 1914, a sewerage system that provides for the present needs of the community and was designed with a view to further extensions and additions as they are necessary. A bond issue of \$25,000 provided for the work, which was done under a commission of citizens of the suburb. It is stated by leading Oakdale citizens and property owners that the city got an immediate return from its bond issue through increase in property values. The suburb always suffered a "flood" in wet seasons and water frequently stood in residents' cellars. Now floods are prevented and the ground water of the low lying area has been greatly lowered, as a superficial investigation will show.

The system is virtually a part of the Louisville city sewer system, and empties into the South Louisville sewer of that system. Eventually the territory now embraced in the corporate limits of Oakdale will be taken into the city, and in fact the South Louisville sewer extends for some distance south of the Louisville city line into Oakdale. At its junction with the outlet of the Oakdale system, the South Louisville sewer is 5 feet 6 inches in diameter, constructed of concrete. The Oakdale sewer at its outlet is 57 inches in diameter. Reduction from the large to the small sewer was provided by a re-inforced concrete section or reduction chamber, as was also the case throughout the Oakdale system where there were changes in diameter.

The largest section of the system is 57 inches in diameter and 222 feet long, and was constructed of segmental tile. The next section is 48 inches in diameter and 500 feet long of which 200 feet was of segmental tile and the remainder of concrete pipe which the contractor chanced to buy at a bargain. The third section, also of segmental tile, was 45 inches in diameter and 180 feet long. The rest of the system is all of vitrified sewer pipe of diameters ranging from 30 inches down to 8-inch laterals. The larger sizes are designed to serve as combined sewers. No provision for storm water has been made in the laterals, although existing residences were permitted to run their downspouts into the sanitary drains. Later more sanitary sewers will be connected up to the mains, and a separate system of storm water laterals will be constructed. Openings were built in the mains for such later connections, but temporarily closed.

Several interesting features are to be noted in connection with segmental tile construction. One was a right angle turn in the 57-inch section, with a radius of 20 feet. The construction here was further complicated by the fact that a 30-inch line entered the main at the curve, and the character of the soil was particularly treacherous.

Soil conditions generally were unusual. This is all "crawfish" land and water invariably rose in the trenches as they were excavated. Pumping had frequently to be

resorted to and the workmen always worked in slushy mud with water ahead. The cuts were made through clays of various consistencies, sand with a quicksand tendency sometimes being encountered beneath these. This was more especially true where the smaller lines were constructed. A fortunate circumstance from the viewpoint of foundation was that, at the depth desired, the excavations reached a stratum of a slaty, gravelly character.

It is sometimes possible to so form the bottom of a trench that the segmental tile can be laid directly on the bottom up to the springing line. Here, however, the character of the subsoil would not permit this, and it was necessary to excavate full width to the foundation level, the space between the lower half of the sewer and the sides and bottom being filled in with well-tamped, rather fine Ohio river gravel. It was provided in the specifications that the sheeting used in construction of this segmental tile work should not extend below the springing line, but the character of the soil made it necessary to extend the sheeting to the bottom. Afterward it was cut off a foot above the springing line. This prevented the shaly, gravelly bottom from sliding into the cut and preserved the void until it could be tamped with gravel. The cuts averaged about 12 feet, ranging from 10 to 15 feet.

Laying the tile was found to be quite simple. The specifications provided:

"Work shall commence with the laying of the bottom or invert tile, which, as the work proceeds, shall be kept well in advance of the completed sewer and in perfect conformity with the lines and grades given by the engineer. This tile shall be solidly and firmly settled into place, well against the tile previously laid, after having placed the proper amount of mortar on the projecting lap. After the bottom tile of the invert has been laid to the proper distance in advance, the remaining portion of the invert and sidewalks up to the springing line of the sewer shall be constructed by the use of templates. There shall be two men, one on either side of the invert tile, for this class of work, and the corresponding tiles on each side shall be laid simultaneously. No tiles will project above or below one another, in order that all joints may be flush. A backing of sand and fine gravel well tamped and compacted shall be placed back of the tiles as they are laid, up to the springing line. * * *

"When the invert and side walls are completed to the springing line, the arch shall be turned by the use of a collapsible form. The contractor shall have on the site of the work a sufficient number of centers, templates and other forms for its expeditious prosecution. No center, templet or other form shall be used which is not clean, of proper size and shape, and in every way acceptable to the engineer. * * *



SEWER UNDER CONSTRUCTION IN OAKDALE, KY.

"All mortar shall consist of one part Portland cement and two parts of clean, sharp sand * * * and shall be placed in the female joints and projecting end laps, and the tile firmly settled in the mortar.

"As soon as the arch is completed, the form or center shall be collapsed, and the tiles allowed to settle into the green mortar without delay. Immediately after the form is collapsed and removed, all joints, both inside and out, shall be pointed, and all spilled cement, sand, mortar or other debris removed from the inner surface of the tiles. Backfilling shall commence immediately after the forms have been collapsed and removed, or as soon thereafter as possible.

These provisions were carried out carefully as the construction progressed. The usual course was followed in excavating, bracing, etc., except for the narrow trenches for the small pipe. A sub-contractor relieved the general contractor of this work, and by use of a Dalton Bros.' excavator handled at a profit work which, he claimed, represented certain loss under ordinary methods of operation.

Line and grade were given by batter boards at the top of the trench and the line of the invert tile was set by plumbing from these. The line of key or invert tile was kept thirty to fifty feet in advance of the rest of the construction. The rest of the invert construction was handled in the same manner as in constructing a brick sewer, two movable templets being used and the voids below and at the side tamped firmly as the work progressed. The tiles came in two-foot lengths and were laid with the joints broken. The invert then was permitted to set until it became hard, the length of time permitted varying according to weather conditions, etc.

The arch was turned with an eight-foot collapsible form, as indicated in the specifications and illustrated in an accompanying photograph. This was of wood adjusted so as to collapse sufficiently to allow free space between it and the inner surface of the arch. Immediately the eight-foot section of the arch was finished, the form was collapsed and withdrawn, joints pointed and backfilling begun. This caused each voussoir or tile to settle into permanent position in the green mortar.

This same plan was followed on the curve referred to, except that a special templet, built of wood to correspond with the curve, had to be provided. Using this, the invert tiles were laid to line and grade and the rest of the work proceeded in a similar manner. Here, however, one-foot tiles were used to enable the turn to be made more smoothly. A shorter section of collapsible form, built on an arc was used for turning the arch. A 30-inch sewer entered the 57-inch at this curve, in line with the sewer beyond the curve, and the opening was provided by the simple expedient of building the segmental wall around a wooden form of the dimensions desired.

As a special precaution on account of the nature of the soil here, it was deemed best to reinforce the arch at this curve with a covering of concrete. There is much very heavy traffic at this point and the nature of the ground is such that it mires to great depth in wet weather. If the street had been paved no reinforcement would have been provided. This reinforcement consisted of a cap of concrete varying from 8 inches at the springing line, where it rested on a shelf cut out of the sides of the trench, to 2 inches on the top of the arch.

Junction openings were made by means of concrete. A form was constructed against the inner surface of the sewer and to correspond to the dimensions of the sewer to be joined to it at this point, and concrete poured between this form and the tile surrounding it. In the same way the reducing sections were managed, the serrated edges of the tile construction offering excellent surfaces for the concrete to adhere to. All such joints

were then smoothly pointed up on the interior surfaces. Since the sewer has been constructed it has several times been found desirable to make openings into the mains, and this has been managed in similar manner without difficulty.

Manholes, which were provided for by the vertical foot, are monolithic concrete. Where these were to be provided for, the arch was not built over the invert, ordinarily an eight-foot section, being left uncovered and the arch continued beyond. The proceeding was similar to other concrete manhole construction, the missing portion of the arch being constructed of concrete and the aperture rising out of the center.

Construction of the segmental tile sewer was performed by five men. The mason and his helper worked in the trench, placing the tiles and tamping the gravel behind. A man at the top of the trench lowered the tiles, one or two at a time, to the helper, by means of a rope slipped through the hole and looped outside. Mortar was lowered similarly in a bucket, while the gravel was shoveled into the bottom ahead of the work. One man wheeled tile and gravel to the edge of the trench. The fifth man was engaged in mixing the mortar and bringing it to the trench.

Roy W. Burks, now of the Louisville city engineering staff and in charge of the city's sewer construction, was designing engineer on the Oakdale system, and William Richards, also in the city engineering department at this time, was engineer in charge of the work. The contract was held by the Middletown Construction Co., of Middletown, Ky., and the sub-contract, for all work from 24-inch down, was held by K. A. Barker. The Oakdale Commissioners of Sewerage were P. D. Crawford, chairman, Joseph M. Bywater and L. I. Williams. The tile used was that manufactured by the American Sewer Pipe Co., of Akron, O.

Since the construction of this system there has been a considerable amount of this character of work done in and around Louisville. The Oakdale sewer was begun in August, 1914, and completed by the first of the following January. The county has put in a considerable amount of 36-inch segmental tile sewer furnished by the National Fire-Proofing Co., and the city, under Mr. Burks, has built rather a large amount of it.

ADDING MACHINES FOR LEVELING PARTIES.

The precise leveling parties in charge of J. H. Peters and G. D. Cowies of the United States Coast and Geodetic Survey, operating in Indiana and Florida, respectively, are recording the readings of the level rods on adding machines as the work progresses. The machine is strapped to the top of a motor velocipede on which the party goes to and from the working ground. The leveling is done along railroads, and the car is moved forward with the observer as the work progresses.

The adding machines are now being used in the field for the first time in such work and the reports received at the survey's office at Washington show that recording can be done more quickly and with less likelihood of errors than when the recorder used the old method of entering the observations in a record book. The back sights and fore sights are recorded separately by the machine in parallel columns. The sums of these columns may be obtained by simply pulling a lever. The difference between these two sums is the difference in elevation between the starting and ending bench marks of the line. The machine is of the listing type, so that it gives a permanent record of the observations on the reel of paper. The saving of time and money in a single season will much more than pay for the cost of the machine.

PRACTICAL STREET CONSTRUCTION—STREET CROSS-SECTIONS

Reasons for Crowning Roadway—Form of Crown and Calculating Same—Amount of Crown for Different Pavements—Side-Hill Cross-Sections—Lop-Sided Crowns and Continuous Cross-Slopes.

From the point of view of traffic, transverse grades are undesirable on either sidewalk or roadway and are inadmissible in a street railway track except at curves. If it were not for rain water, roadways would probably be made flat between curbs, and sidewalks between curb line and property line, except as the grade of the original surface made some cross-slope necessary, or at least desirable.

If a roadway were made with a horizontal cross-section, and could be constructed and afterward maintained in this condition, water would flow with the longitudinal grade of the street at equal depth over the entire width, this depth increasing as the water accumulated toward the foot of the slope. There it would be necessary to provide some means for removing the water from the surface, either by placing an inlet grating across the entire roadway or by giving the roadway a crown at the foot of the slope and thus diverting the water toward inlets at the curb on either side.

This construction has been proposed, and approximated in practice, but is very infrequent. It is objectionable in that, on the lower stretch of each grade, the amount of water flowing in the roadway causes inconvenience to both horses and vehicles and to pedestrians crossing the street. In case of macadam streets, water flowing over the surface in this way will erode such surface; and especially after incipient ruts or other depressions have formed, it will follow and increase such depressions. In all streets the greater part of the wear comes at the center, and a roadway originally made flat will gradually become dished and rain water will concentrate in the center rather than at the sides, thus flowing where it will cause the most inconvenience to traffic rather than the least.

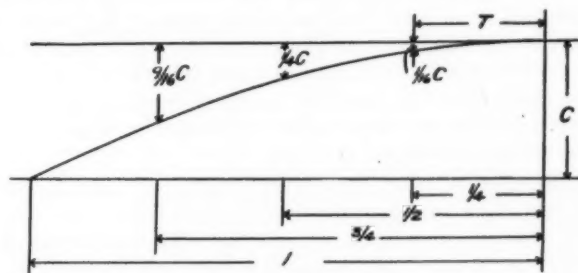
It is therefore almost the universal practice to give a crown to a roadway. The matter is frequently overdone, however. The crown should be just sufficient to shed the water to the sides of the roadway, since the greater the crown the greater the inconvenience to traffic and the more such traffic and the wear resulting therefrom are concentrated in the center of the roadway. The more uneven the surface, the greater the crown or cross-slope which is necessary to prevent water standing in any depressions therein. Also the greater the injury which would be done by water flowing along the surface, the greater the necessity for carrying it directly to gutters which are adapted to removing it without injury to its surface. For both these reasons, macadam, gravel and other road surfaces which rely upon damp earthy matter for binding the coarser aggregate, should have a greater crown than is required by asphalt, brick or other block pavements, concrete and other pavements which are little affected by water and which are quite smooth when properly laid.

As explained above, a gutter carrying water down the middle of a roadway generally is considered objectionable

because the greatest amount of moving traffic is concentrated here. There may be cases, however, such as alleys or other narrow streets without sidewalks, in which this form of cross-section is preferable to crowning the street. Where the street is dished, the slope toward the central gutter is desirable for the same reason and should be the same in amount as that from crown to side gutters.

There are two general forms of cross-section employed in crowning a roadway; one, by providing a straight slope from each gutter to the crown, the slopes usually being connected at their intersection by a flat curve; the other, by giving the entire cross-section the form of a curve extending from gutter to gutter. The former has the advantage that the slope near the gutter is no greater than on other parts of the street, and therefore there is not the tendency for traffic to concentrate at the center which is caused by the steeper slopes at the sides occasioned by a curve cross-section. On the other hand, the steep side-slope of the curve cross-section serves to concentrate surface water into a narrower gutter channel than does the flat slope unless the gutter on the latter cross-section be formed by a depression below the general slope of the cross-section. Another objection to the straight slope is that, as the pavement wears, and especially on streets where there are two continuous lines of traffic and consequently where the wear is greatest, this wear occurs a few feet on either side of the crown and results in a dishing of the slope at these points which, if it becomes at all considerable, will hold the water and prevent its reaching the gutters.

If the cross section is made curved, the most common practice is to make this curve a parabola, chiefly because of the ease with which it can be laid out; one law of the parabola being that the distance that the curve at any point is below a tangent to the crown varies as the square of the distance of such point from the crown. In staking out such cross-section, therefore, it is only necessary to know the distance from crown to gutter and the depth of the gutter below the crown, and the depths of any intermediate points below the crown will



CALCULATION OF PARABOLIC STREET CROSS-SECTION.

C is difference in elevation of crown and gutter. The horizontal distance between the two is divided into four equal parts, and the drops below the crown elevation are the fractional parts of C which are given, obtained by squaring the fractions at the bottom of the diagram.

This represents a roadway cross-section with the vertical scale exaggerated ten times. The solid lines show the methods of crowning, one by a parabola, the other by straight lines connected by a curve. The dotted lines show the result of the same amount of wear—a maximum of $\frac{3}{4}$ inch—on the quarter points of each surface, and how depressions form in the straight-line cross-section.



USE OF PARABOLA AND OF STRAIGHT LINES IN CROWNING ROAD COMPARED.

then be to the depth of the gutter as the squares of their respective distances from the crown. In the curved section, a considerable amount of wear fairly well distributed over the quarter points or haunches, (the portion approximately one-half way between crown and gutter) will still leave sufficient slope toward the gutter to permit the water to flow off.

As already stated, the amount of elevation of crown above gutter should vary with the material of which the roadway is constructed. Byrne, in his "Highway Construction," gives the following as the ratio of rise to distance from gutter to gutter: Earth, 1-40; gravel, 1-50; broken stone, 1-60; stone blocks, brick and asphalt, 1-80; wood blocks, 1-100.

Andrew Rosewater some years ago advocated the following rule for smooth streets like asphalt: crown = $W(100-4f)$

For macadam, stone and other less smooth street, crown = $\frac{W(100-4f)}{6,000}$ in which W is the

distance between curbs in feet, and f is the feet fall per 100 feet of street. It seems to us that this gives too much crown for asphalt and other hard pavements and not sufficient for macadam. It will be noticed also that it would decrease the crown as the grade increases. From the point of view of shedding water to the gutter as quickly as possible, the reverse of the rule should be followed, since the steeper the grade the greater the tendency for the water to flow down the street rather than across it and to follow ruts or any longitudinal depressions in the roadway. Presumably Mr. Rosewater's aim, however, was to accommodate traffic and make it easier for teams to climb a steep grade by winding from side to side.

Crowns as flat as and even flatter than 1 in 100 have been used for asphalt streets in New York; $1\frac{1}{2}$ in 100 in Wabash Ind.; 1.4 in 100 plus .03 feet in Champaign, Ill., and $1\frac{1}{4}$ to $1\frac{1}{2}$ in Indianapolis.

These ratios give the crown in terms of the width between curbs, with the assumption that the crown will be in the middle of the roadway. This location of crown is the best construction, but is not always practicable, and a better plan seems to be to express the crowning in distance from gutter to crown of roadway, wherever the latter may occur; in which case this distance is taken as one-half that given in the above ratios. The amount of crown will be different on the two sides of the street when the gutters are not at the same level, which is frequently the case; which is another reason for giving crowning in terms of distance from gutter to crown rather than total width of roadway.

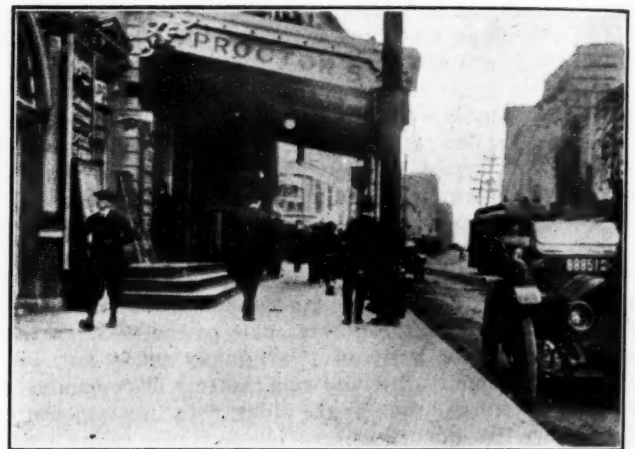
On side hills it sometimes seems necessary that one sidewalk be made considerably lower than the other if the amount of excavation on one side and of fill on the other, and also the relative elevations of building lots and sidewalks, are to be made practicable. In such cases it is of course still possible to give both gutters the same elevation by using a very shallow curb on the downhill side and a very high one on the uphill. (Further discussion of this will be given at length in the next issue.) An alternative is to leave one gutter higher than the other. When this is done, if the roadway be given the same general slope from each gutter toward the crown, the crown will then be thrown toward the uphill gutter. Some would always place the crown in the middle of the street, keeping the rate of slope to the lower gutter below a certain maximum and that from the crown to the upper gutter above a certain minimum. The latter plan probably gives a somewhat better appearance to the

street, but the former would seem to make better provision for both traffic and cross drainage. In either case, however, the slope from crown to lower gutter should be kept within a certain limit beyond which it would be inconvenient for vehicles. Such a cross-slope probably should never exceed one foot in twenty-five for asphalt or other smooth pavements, nor one in twenty for any other pavement; and thirty-five and thirty respectively would be preferable.

If an asphalt roadway be 30 feet wide and one gutter 1.2 feet higher than the other, this would give a continuous slope from one gutter to the other and would set a limit to the amount of difference in elevation which is permissible between the two gutters.

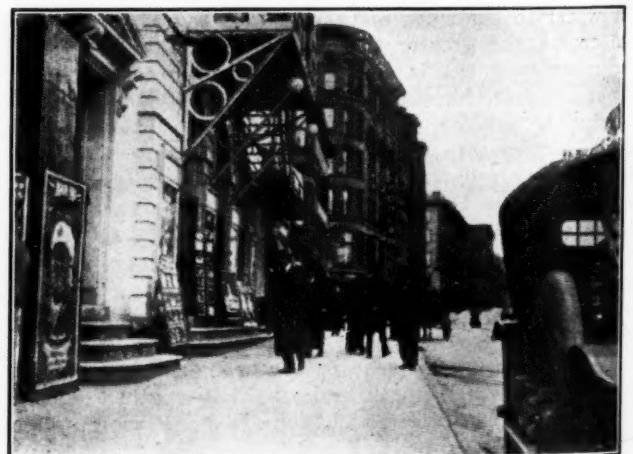
SIDEWALK ENCROACHMENTS IN ALBANY.

In connection with the work of repaving business streets and constructing concrete sidewalks in Albany, N. Y., sidewalk encroachments of various kinds have been removed and practically the entire width of the walk restored for pedestrian use. Under the old building code, store fronts were allowed to project over the



ENCROACHMENTS ON AN ALBANY SIDEWALK.

Entrance steps along building line and awning posts along curb reduce the effective sidewalk width by nearly if not quite half.



ENCROACHMENTS REMOVED.

Removal of encroachments not only increases effective sidewalk width, but gives a better view of the street.

sidewalks 18 inches beyond the building lines, and under the general city ordinances all property owners were allowed a certain width for basement entrances and stoops. These, of course, could not be disturbed; but stone and wooden platforms were removed and steps substituted close to the building. Awnings supported at the curb line by posts were removed and projecting show cases set back to the line of the store fronts.

Municipal Journal

Published Weekly at
50 Union Square (Fourth Ave. and 17th St.), New York
By Municipal Journal and Engineer, Inc.
Telephone, 2805 Stuyvesant, New York
Western Office, Monadnock Block, Chicago

S. W. HUME, President
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Secretary
A. PRESCOTT FOLWELL, Editor

Subscription Rates
United States and possessions, Mexico, Cuba.....\$3.00 per year
All other countries..... 4.00 per year
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for. Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

MAY 11, 1916

CONTENTS

Milwaukee's New Municipal Street Lighting System. (Illustrated.) By F. H. Bernhard.....	645
Repairing Flood Damages at San Diego.....	648
Segmental Sewer in Oakdale. (Illustrated.) By G. D. Crain, Jr.	649
Adding Machines for Leveling Parties.....	650
Practical Street Construction—Street Cross-Sections. (Illustrated.)	651
Sidewalk Encroachments in Albany. (Illustrated.)... ..	652
Determining Sewage Purification Results.....	653
An Argument for Bridge Inspection.....	653
Motor Fire and Other Vehicles in Cities.....	654
Sidewalks on hills.....	654
The Week's News. (Illustrated.).....	655
Legal News; Notes of Recent Decisions.....	660
Municipal Index	662
News of the Societies.....	665
Personals	666
New Appliances. (Illustrated.).....	668
Industrial News	668
Contract News	671

Determining Sewage Purification Results.

In the majority of cases the object of treating sewage is to prevent the pollution, beyond a certain point or degree, of the stream or other body of water into which the effluent is discharged. It would appear, therefore, that the satisfactoriness of the treatment at any given time would be measured, not so much by chemical, physical and bacterial analyses of the effluent, as by the effect produced upon the stream by such effluent—generally the prevention of a nuisance in the stream. Unfortunately, comparatively few plants make any effort at all to keep track of the efficiency of their operation, too many managers being satisfied if they can keep the plant operating so that it itself is not a nuisance.

At the Columbus, Ohio, sewage disposal plant, however, not only are the customary analyses of sewage and effluent made regularly, but the condition of the stream below the plant outlet is watched, and the physical and chemical condition of the water at two points above and four points below the outlet is determined every week. These determinations constitute a record of the condition of the stream which serves several purposes. For example, such a record may be very valuable as evidence in case of law suits for damages brought by riparian owners or towns lower down the river. But its chief

value is the means it affords to study the effect upon the stream of increase in amount of sewage caused by growth of the city, or of changes in method of treatment, or deterioration of plant in effectiveness. It is true that analyses of the effluent will theoretically give this information; but the knowledge which we have of these things is not yet sufficient to permit certain translation of the results of such analyses into effects upon the stream.

The inspection of the Scioto river by the management of the Columbus plant is made at points 2 miles and a half-mile above, and 7, 11, 16 and 26 miles below the outlet. At each of these, determinations are made of the temperature, dissolved oxygen, per cent of saturation, dissolved oxygen consumed, odor, color, and gassification of the water, material floating in the water, sludge deposits in the river bed, development of odor after two days' incubation, and stability by methylene blue test. A comparison of these determinations for the several points gives a good idea of the effect upon the river of the sewage effluent discharged therein, and the endurance of this effect or self-purification of the stream over a flow of 26 miles. Also the effect upon these changes of season of year, floods, etc. For instance, on May 17, 1915, the stability dropped from 99 above the city to 5 below the outlet, but rose to 30 in the next four miles, to 94 in five miles more, and returned to 99 in the next ten miles. But at no time after June 1st did the stability at any inspection station fall below 99.

Analyses of the effluent itself are of course kept at the same time; and a comparison of these with the river inspection, with consideration of volume of river and sewage flow, plant condition, etc., should in time permit a fairly accurate determination of the relation between the conditions of effluent and of river respectively.

But until such relation is established, the examination of the river eliminates one important uncertainty—the inferential relation between the character of effluent and its effect upon a diluting stream. Such an examination is, after all, the final and convincing test; and will probably be especially convincing to city officials and tax payers; and these are the ones who are entitled to demand and receive information which they can understand.

An Argument for Bridge Inspection.

The desirability of regular inspection and effective maintenance of steel bridges was referred to editorially in the April 27th issue. Since then our attention has been called to an article in the Coatesville Record which emphasizes our plea for inspection. Says this article:

The outcome of the Le Baron trial seems to indicate that a bridge inspector would be a profitable investment for Chester County. During the past few years the amount of damages that have been collected from the county as a result of bridge accidents brought about by unsafe structures has been great enough to have paid the salaries of several high-priced men to have devoted their entire time to the work of inspecting bridges.

Only a few years ago the accident at the bridge at Downingtown, when a traction engine fell into the Brandywine, cost the county many thousands of dollars. Now comes the Le Baron suit, which, together with the settlement of money that was made with the other two men who were injured there, will amount to many thousands more. There is every reason to believe that a competent inspector would have saved the county all of this money alongside of which his salary would have been a very small matter.

We wonder how many counties find that the damages which they are called upon to pay on account of bridge accidents would much more than suffice to hire a competent inspector (or periodical inspection of all bridges) and do needed maintenance work. We are convinced that there are a great many of them.

MOTOR FIRE AND OTHER VEHICLES IN CITIES

Rapid Increase in Their Use by Municipalities in Two Years—Pieces of Fire Apparatus More Than Doubled in Number.

The figures used in the following discussion have been taken from the tables published by Municipal Journal during the past three years, giving data concerning fire department apparatus, supplemented by such other as were obtainable. The fire apparatus tables are summarized in the accompanying table, which shows the types of fire apparatus which have been used during the past three years and also the types which have been more favored during the past year. Just now, for instance, triple combinations and ladder trucks are increasing rapidly. Fewer cities over 50,000 population are represented in the 1915 tables, and the growth shown, therefore, indicates more accurately the increase in the smaller cities.

There are about 1,300 incorporated cities over 5,000 population (by 1910 census), about 115 of which are over 50,000. The tables of 1915 represent 80 (or 70 per cent) of the larger cities and 705 (or about 55 per cent) of the smaller. About 60 per cent of the cities reporting have motor apparatus. At the same rate for the 1,300 cities over 5,000 each, about 800 would report motor apparatus. There are also a great many (there are nearly 10,000 of such places) which range in population from 600 up to 5,000 which are not represented. Many of these have one or more pieces of motor apparatus.

As the same cities do not report each year, we are not able to give the number of cities purchasing new apparatus. In 1914 and 1915 the cities were asked as to the purchases contemplated for the coming year. The replies totaled 448 and 274 pieces, respectively, the decrease for 1915 being due, probably, to the prevailing financial stringency; though a great many cities stated they were going to buy some, but were unable to state exactly in advance. In 1914, 400 cities reported the purchase of 459 pieces of motor apparatus. The amount in use has more than doubled in the past three years.

Fire apparatus is not rated in tonnage and therefore it is impossible to state the volume of equipment in this respect.

Assuming that three-quarters of all cities replying were able to give their contemplated purchases and that the average of 1914 and 1915 (since the latter was an exceedingly poor year) is about the annual purchase, we would have 1,125 cities purchasing 725 pieces of apparatus. At this rate for the 1,300 cities of over 5,000 population, 840 pieces would be purchased per year. At an average price of \$4,000 for each piece, the amount spent would approximate \$3,360,000, not including the many smaller cities, which would total probably half as much in addition. Also, due to the small purchases last year, the sales this year will probably show a considerable increase and may exceed \$8,000,000.

The economy of motor apparatus has been demonstrated repeatedly and is acknowledged.

No figures whatever are available as to the cities which have adopted motor equipment in other departments during the past two years. But of the 100 largest cities in the United States (all over 53,600 population), records in the office show that 63 use motor driven equipment elsewhere than in the fire department and there are probably 15 or 20 more of which we have no records. For cities ranging from 20,000 to 53,000, approximately

one-half are users of motor trucks in some department. Several state and county highway departments also use motor trucks.

For street and road work, garbage collection, etc., 5-ton sizes are mostly used. Street cleaning, flushing and sprinkling trucks are about 3-ton size. A large number of machines are used for ambulance, police and utility purposes, waterworks, sewers, etc.; these average $\frac{3}{4}$ -ton to 1 $\frac{1}{2}$ tons.

Growth of the Use of Motor-Driven Fire Apparatus.

Year	1913	1914	1915
Cities replying	600	725	785
Cities reporting motor apparatus..	267	435	460
Chief's cars reported.....	210	368	423
Squad wagons reported.....	24	27	32
Hose wagons	49	143	127
Chemicals	24	57	60
Chemical and hose.....	141	288	303
Triple combinations	244	361	481
Hook and Ladders.....	59	146	212
Water Towers	7	15
Gasoline pumpers	149	101	137
Gasoline driven steamers.....	33	71	95
Repair wagons	21	{ 20	27
Fuel and service wagons }		{ 15	44
Tractors	52	227	242
Totals	1,006	1,831	2,198

SIDEWALKS ON HILLS.*

The side-hill street problem is often a perplexing one. The solutions have involved amazing extremes. In some instances property has been materially damaged by thoughtlessly adhering to some "established" grade, or custom. It is not necessary to place the curb and walk at uniform elevations above the roadway. There are instances, however, in Minnesota towns, where thoughtless engineers are following this rule. They have evidently not learned that concrete construction and concrete rules are separable. Damaging property, without increasing either the usefulness or beauty of the street, is not good engineering. A typical cross-section which has given some degree of satisfaction in at least one Minnesota town is elastic in its application. It provides for variable transverse slopes and practical adjustments of gutters, curbs and sidewalks. A slight increase in the height of the curb, and a considerable increase in the transverse slope between the curb and walk on the up-hill side of these streets, add to the appearance of such a street. Where necessary, a 20 per cent slope from the curb up to the walk is not objectionable. For the benefit of property on the low side of the street the curbs may be located considerably nearer the low than the high side of the street, thus permitting of a reduction in the street grade elevation. These variations in design minimize the damage to elevated or depressed residence property. In extreme cases the walk has been narrowed, and occasionally placed at the curb.

In hilly towns sidewalk steps are occasionally a necessity. The designer of them should remember that walking on the street is usually more rapid than walking indoors. Hence the treads of sidewalk steps should be considerably broader than for indoor stairs; 15 inches is a practical width, the risers being approximately 6 inches. A long flight in one Minnesota town has treads of 40 inches. The acrobatic feat of repeatedly approaching the risers with the same foot produces a tiresome feeling of deformity. Series of 15-inch treads, sparated by landings, would have been a better design.

*Brief extracts from paper by M. E. Chamberlain before the Minnesota Surveyors' and Engineers' Society.

The WEEK'S NEWS

Colorado Scenic Road—New Chicago Bridges—New Sanitary Laws of New Jersey—Smallpox in Wilmington, Del.—Mosquito Fighting in New Jersey and New York—Taxing Utilities in Portland, Ore.—New York's Police and Firemen Get Medals—New Commission Cities—The Debt of Chicago—San Francisco's Street Railways—The Pittsburgh Car Strike—Consolidation of New York's Repair Shops.

ROADS AND PAVEMENTS

Fete to Mark Opening of Scenic Road.

Denver, Colo.—One of the biggest good roads celebrations ever held in the West is to mark the opening of the new Denver-Pagosa-Durango highway cut-off, next July. The towns in the southwestern part of the state have begun the movement to celebrate the opening of the Wolf Creek road, which will be opened this spring, and now the towns and cities on this side of the continental divide are joining in a great celebration. State highway commissioner Thomas J. Ehrhart has received communications from Pueblo, Del Norte, Monte Vista, Salida, Saguache, Pagosa Springs, Durango and other cities, promising participation in the celebration. The road will be finished probably in June. It is completed over the pass, and the only work that remains is well below timber line in the valley of the South Fork of the Rio Grande. It was necessary to re-route the road through this valley. The most difficult part of the work has been completed, across the pass. The road has cost more than \$50,000 and the state has put up most of the money. It opens a direct route diagonally across Colorado through a part of the country that has heretofore had no close highway connection with the eastern slope. The heaviest part of the work on the road is on the south side of the continental divide. The road crosses the range at an elevation of about 10,000 feet, and offers easy grades. In one or two places there is a 9 per cent grade, but the general rise is not over 2 per cent. The road goes through scenery of wonderful beauty. Besides offering a scenic highway of unparalleled attractions, the new road to Pagosa Springs will open a trade outlet to the southwestern part of the state which will be of great commercial benefit.

City Officials on Trial for Bad Roads.

Pottsville, Pa.—Mayor Mortimer and councilmen Jungkurth, Bearstler, Schoen and Davies, who were indicted for misdemeanor in office and for failure to repair certain streets of the city, were all placed on trial. Mr. Schoen, who is the superintendent of streets, was also indicted separately upon the same counts, in addition to the joint indictment with the other members of the council. After repeated warnings by the court to repair the roads complained of the repairs were not made. The defense was that material and employes could not be obtained to do the work and that the bad weather conditions hampered the officials. Councilman Schoen was found guilty of a misdemeanor but was "recommended the mercy of the court." The other officials were found not guilty.

Four New Chicago Bridges.

Chicago, Ill.—Four new bridges across branches of the Chicago river will be opened to the public before July 1, and work on other new bridges is to go ahead rapidly this year, according to Thomas G. Pihlfeldt, city engineer of bridges and harbors. The Montrose avenue bridge, which is to cost \$70,000, has already been completed, but it will not be ready for traffic until the middle of May. In June the Belmont and Webster avenue bridges, costing \$300,000 each, will be opened. These bridges are of the bascule type. Late in June the new Lake street bridge now used for elevated traffic only will be opened to street traffic as well. This span cost \$600,000 and its complete opening is delayed by the construction of a viaduct over the Chicago, Milwaukee and St. Paul tracks. Work on the Monroe street bridge is to begin at once. Mr. Pihlfeldt said. It is

to cost \$350,000, half of the cost to be borne by the Union Station Company, and, it is expected, will be completed by Thanksgiving day. With the completion of this bridge the Madison street bridge will be ripped out and street cars rerouted over the new Monroe street bridge. The Van Buren street bridge, which was ordered out by the government in September, 1913, is to be removed before the end of the present year. The new bridge will cost \$550,000. The bridge department also has completed plans for the new LaSalle street bridge and the proposed Wells street bridge. It is also working on plans for a bridge connecting Franklin and Orleans streets. Plans for a new bridge at Twelfth street have also just been completed, and it will cost \$652,000 and will, according to Mr. Pihlfeldt, surpass all previous bridge architecture in the middle west.

Brick Roads in Florida.

Deland, Fla.—Construction of brick roads is becoming extensive throughout the state. Volusia County recently let to the Southern Clay Manufacturing Company of Chattanooga, Tenn., a contract for 200,000 yards of 3½ inch wire-cut lug brick pavement in the Deland-Lake Helen district. The brick is to be laid on edge on a natural soil foundation and grouted. The road will be about 26 miles long and nine feet wide, except in Deland itself, where it will be paved 50 feet wide. Many miles of brick road were constructed in Orange County in 1915, and other sections have similar improvements scheduled for this season.

SEWERAGE AND SANITATION

Sanitary Survey Completed.

Shreveport, La.—J. H. O'Neill, sanitary engineer of the state board of health, has just completed a sanitary survey of the city of Shreveport, and the report has been forwarded to health officer Chandler. The report covers in detail the toilet arrangements of the 10,135 premises in the city, the water supply, the removal of garbage, etc. The report shows there are 1,277 premises without water supply, 66 supplied with shallow wells and 5,034 by cisterns. According to the survey, Shreveport has a population of 36,432.

New Sanitary Laws.

Trenton, N. J.—The state department of health has promulgated a series of regulations respecting nuisances which will constitute part of the new state sanitary code now in course of preparation. The new regulations will become operative June 1 and under the act creating the department will have all the force and effect of law, becoming in fact a part of the statute for prevention of disease. Local boards of health will be required to enforce the regulations in the same manner as they are required to enforce the laws pertaining to health matters. The regulations adopted deal specifically with that class of nuisances that are known to injuriously affect health and that are already prohibited by health authorities in all progressive communities. By enacting these regulations at this time the state department provides the means by which local boards of health may prevent the occurrence of typhoid fever and other intestinal infections and malaria that are more prevalent during the summer and fall seasons. The new regulations begin with a general prohibition against any person, or private or municipal corporation, maintaining or permitting to be maintained anything whatsoever which is a hazard or a danger to public health. Then follows a prohibition against maintaining any well or other

supply of water used for drinking or household purposes which is polluted in any manner that may render such water injurious to health, or which is so situated or constructed that it may become so polluted. Following this are two provisions dealing with the construction and maintenance of outhouses and prohibiting their location within 100 feet of any stream unless provided with water-tight vaults. The following regulations are also included:

"No person, or private or municipal corporation, shall maintain, or permit to be maintained, any accumulation of decomposing animal or vegetable matter in which fly larvae exist on any premises upon which is located an hotel, boarding house, lodging house, restaurant or any other establishment in which foods intended for sale or distribution are prepared, handled or sold, or at any point on any other premises within 250 feet of any dwelling occupied by another."

"No person, or private, or municipal corporation, shall maintain or permit to be maintained, any pool, pond, ditch, stream or other body of water or any cistern, privy vault, cesspool, rain barrel or other receptacle containing water, in which mosquito larvae exist."

Smallpox Epidemic Spreads.

Wilmington, Del.—Feeling that the smallpox situation in this city is serious the new board of health, with the advice of the old board, ordered all of the moving picture and other theatres and all places of amusement in the city closed. All carnivals and shows are barred. All citizens were requested to be vaccinated. There have been thirty cases of the disease in this city since the present outbreak began, but only three among white people. It is thought that the disease spread through some people escaping the quarantine placed over the houses where cases had occurred. Guards have been placed around houses and several negroes who escaped were promptly returned and will be prosecuted later. It was found that a man employed in one of the local leather manufacturing plants had been in a house where there was smallpox and several hundred workmen were vaccinated. Some of the men attempted to escape by jumping from the windows on the lower floors, but were stopped by the police. Having requested other citizens to be vaccinated at once, Mayor Price was himself vaccinated to set an example. The disease is spreading to surrounding towns and cases have been reported among negroes in Middletown and Bridgeville. All trolley cars between Wilmington and Chester, Pa., are being fumigated daily and carmen have been vaccinated. The public safety department and the board of health are taking strict precautions and ordered all dance halls closed.

Mosquito Extermination in New Jersey.

New Brunswick, N. J.—The "Mosquito Exterminator," a weekly paper issued by the experimental station at New Brunswick has had its first issue. It will be run weekly throughout the season, and will tell in a condensed form of the work which is being done in all parts of the state. Dr. Headlee, state entomologist, is behind this new scheme of placing the mosquito work before the public. The paper states: "The present season of mosquito work opens with Hudson, Bergen, Essex, Union and Atlantic counties making an effort to control the breeding of all species of mosquitos within their territories. Combined they cover

an area of 1,154.80 square miles, of which 128.46 square miles (82,215 acres) are salt marsh, and have a population of one and a half millions of people. The combined appropriation for these five counties is \$153,000, which represents 10 cents per individual, or .10 per \$1,000 of taxable values. The conditions in Atlantic county are different from those in the other counties in that of the enormous salt marsh area on which mosquitos breed only 40 per cent is drained. It is hoped, however, that the concentration of the ditching adjacent to the large centers of population will afford relief to the great majority of the citizens of that county. The season opens with Passaic county planning her work for the southern half, principally in and adjacent to the cities of Paterson and Passaic. Middlesex county is planning to take care of her 8,000 acres of salt marsh, and to furnish expert oversight for locally supported campaigns in New Brunswick, Perth Amboy, Metuchen, Woodbridge township, and perhaps in other places. An Eaton ditching machine has been purchased and is now at work on the marsh. Monmouth county is planning to maintain the ditching already established on her 3,000 acres of salt marsh, and to add to the system as her funds will permit, particularly in the Belford section. Ocean county is planning to care for her 20,000 acres of drained marsh and to spend such of the funds as are left on cutting additional ditching in the undrained portion."

Newark, N. J.—Chief Inspector John W. Robbins of the Essex County Mosquito Extermination Commission announces that practically no breeding on the Newark meadows will be noted this summer. With the exception of one patch on the bay front, every section of Newark's 4,000 acres of meadow land is enclosed by dikes and cut by ditches. The section which is not diked is properly ditched and will not carry tide water for a period sufficiently long to allow extensive breeding. The mosquito commission, of which Dr. Ralph H. Hunt is president, has installed in the last two years twenty-two tide gates. The largest cost \$1,900 and a month and a half of labor. The cost of the commission's permanent ditches was approximately \$13,000, to which has been added for dikes and tide gates \$7,800. The accompanying illustrations show views of one of the tide gates.

A Week's Campaign Against Mosquitos.

New York, N. Y.—It is expected that "Mosquito Week," which has just closed, will have proved successful in helping towards the elimination of the pest. The Interstate Anti-Mosquito Committee, composed of mosquito exterminators from New York, New Jersey and Connecticut, has distributed 1,000,000 leaflets and 1,000 jars of live mosquitos among the public and parochial schools as the beginning of an educational campaign. According to the committee the entire salt marsh area of this city will be drained this summer, and the work has already been begun with appropriate ceremonies. Public works commissioner Edmund W. Voorhies of Brooklyn and health commissioner Emerson, accompanied by sympathizers in the anti-mosquito movement, dug the first spadeful of earth from the Jamaica



Courtesy, Newark (N. J.) Evening News.

TIDE-GATES IN ESSEX COUNTY (N. J.) MOSQUITO ELIMINATION DITCHES.

marshes at Spring Creek, Old Mill, Jamaica Bay. The program designated the occasion as Salt Marsh Day. An electrically operated ditch digger is to complete the work of excavating about 4,000,000 feet of trenches, in order that all stagnant water may be drained. It is expected that the work will require about 150 days. In the program of the commission for the week was Householders' Day, celebrated by an examination of the roof gutters and back yard puddles for "wrigglers." The following day was Swamp and Puddle Day, when those interested in the work of the commission were requested to report the presence of swamps and puddles near their houses. Moving Picture Day and Scout Day completed the week.

Measles Closes Schools.

Lancaster, Pa.—Measles have become so prevalent here that City Superintendent Work has ordered two schools closed. Three hundred cases have been reported and as many more, it is calculated, are not reported.

School for Texas Health Officers.

Austin, Tex.—Dr. W. B. Collins, state health officer, has issued a call for a general meeting or school of instruction for city and county health officers of Texas, to be held at Galveston on May 12. The school will continue for two weeks and there will be a number of prominent physicians and others on the program for addresses. Dr. Collins expects there will be several hundred doctors in attendance from all over the state.

WATER SUPPLY

Jersey Water Commission Appointed.

Trenton, N. J.—The four members of the North Jersey Water Supply Commission, authorized by laws of the last session of the legislature, have been appointed by Governor Fielder. They are George F. Wright of Paterson, one year; Ernest C. Hinck of Montclair, two years; Dr. William E. Ramsay of Perth Amboy, three years; Laurent J. Tonnele of Bayonne, four years. Dr. Ramsay and Mr. Tonnele are members of the present State Water Supply Commission, which goes out of existence July 1, when its functions, other than those taken over by the North and South Jersey Water Supply districts, will be vested in the Department of Conservation and Development. Mr. Wright was formerly a member of the State Water Supply Commission. Mr. Hinck was at one time Mayor of Montclair. The law creating the North Jersey Water Supply District provides that the salary of the members of the commission shall be at the rate of \$1,500 a year until the first contract has been signed by a municipality, after which their salaries are increased to \$3,000. The lowest salary is cumulative, not being payable until a municipal contract has been made. It then becomes chargeable as part of the cost of water supply development. The commissioners appointed will have charge of the development of the Wanaque watershed. Their district includes the counties of Essex, Sussex, Warren, Hunterdon, Passaic, Morris, Somerset, Bergen, Hudson, Union and Middlesex.

City Has Power to Order Service Connections.

Angola, Ind.—The State supreme court at Indianapolis has upheld the authority of city officials to require property owners to put in sewer and water connections to the lot line prior to the paving of the street or to have the connection made by men employed by the city and collect the amount of the cost from the lot owner. The ruling is made in reversing the Steuben circuit court in sustaining a complaint by John Croxton and others against the city of Angola to enjoin the collection of the cost of making such connections for lots owned by them. The city in July, 1912, passed an ordinance requiring the owners of property fronting in Maumee street to make sewer and water connection to the lot line with lead pipes, and where the connections had previously been made by iron pipes to replace them with lead pipes. This ordinance was in contemplation of paving Maumee street. The owners of some of the lots refused to comply, and the city made the connections and sought to collect the cost. The owners of the lots filed suit for an injunction to prevent the col-

lection because, it was contended, the ordinance was void because the city had not complied with the formalities requisite to make an assessment for a street or sewer improvement. The supreme court holds that the statute under which the ordinance is authorized and improvement made, contemplates a police control of the city over such matters as the sewer and water connections, and that it was not necessary to serve notice and the other formalities made requisite for the making of an assessment for a street or sewer improvement.

Water Company Complains of City Competition.

Lebanon, Pa.—Complaint that the city of Lebanon is furnishing water to a district recently annexed to the municipality without having secured a certificate of public convenience from the public service commission has been made by the Lebanon Valley Consolidated Water Company to the commission at Harrisburg. The action declares that the water company, which furnishes water in districts surrounding Lebanon, has suffered invasion by the city which laid mains into the annexed district and is in competition with the company. The district, it is held, cannot be entered by the city for the purpose of furnishing water without state sanction. This case is said to be the first of its kind to come before the commission.

STREET LIGHTING AND POWER

Lower Gas Rate.

Lafayette, Ind.—Following a conference with Mayor Thomas Bauer, C. A. Geist, president of the Northern Indiana Gas and Electric Company, has announced a reduction in the gas rate from \$1 to 90 cents to take effect July 1. A sliding scale is to replace the present one-price scale, the new schedule being 90 cents a thousand for the first 10,000 feet, 80 cents a thousand for the next 20,000 feet, 70 cents a thousand for the next 20,000 feet, and 60 cents for all in excess of 50,000 feet, with a minimum charge of 50 cents a month. Mr. Geist said that the cost of manufacturing gas is approximately 10 cents a thousand feet more than it was a year ago, but it is said many here believe a greater reduction should have been made. The Retail Merchants' Association has voted unanimously to circulate a petition to demand 75-cent gas, and to go before the public service commission with that petition.

City to Sell Plant.

Adair, Ia.—At the special election held here to decide on the proposition to sell the local municipal electric light plant to the Iowa Railway and Light Company of Cedar Rapids the vote was practically unanimous in favor of selling. The plant will be turned over to the purchasing company in two or three weeks and twenty-four hour service will then be inaugurated.

Gross Receipts Utilities Tax Illegal.

Portland, Ore.—Two Portland ordinances—one levying a license of 3 per cent on the gross receipts of concerns selling electricity, and the other a similar license on concerns selling gas—have been pronounced void by the supreme court at Salem. The ordinance levying a license on the sale of electricity was declared void in the case of the City of Portland, appellant, vs. the Portland Railway, Light & Power Company, and the other in the case of the City of Portland, appellant, vs. the Portland Gas & Coke Company. The latter came up on rehearing. In rendering its decision declaring the latter ordinance invalid, the court said the same principles of law were applicable to both cases. "The ordinance cannot be sustained as a tax on property, because the city cannot levy a property tax for general purposes except on the property and in the manner pointed out by the general laws," said the court. "Those regulations specify the items of property which are to be assessed and the city cannot enlarge or lessen the specifications, because all property taxes levied by any incorporated city shall be levied on property therein assessed, upon valuation shown by assessment rolls compiled by the assessor. The ordinance is therefore void, if it imposes a tax on a franchise as property; and the ordinance is likewise void if the tax

is levied on earnings as property listed and valued in the county assessment roll. The court says also that the ordinance cannot be sustained on the theory that it is a license or a privilege tax on the occupations or business, because no phase of the ordinance presents any semblance of a license as described in the charter; "not even a pretense is made of granting a license; nothing is prohibited; failure to pay the tax only creates a debt and the continuance of business is not inhibited; the very terms of the title of the ordinance indicate that the design is to levy a license on the gross receipts of persons and corporations engaged in selling electricity." The city loses about \$350,000 by the decision. The ordinance was passed by the voters of the city in 1911. An effort was made to collect the amount alleged to be due under it, but the Portland Gas & Coke Company and the Portland Railway, Light & Power Company protested and finally began suit against the city attacking the validity of the measure. Each year the two companies have filed a statement of their gross earnings and the amount which would be due the city under the ordinance, together with a protest against paying the latter. The council has not been counting on ever securing this money, as there always has been a serious question as to the validity of the ordinance.

City Wins Reduced Rates.

Bangor, Pa.—A final adjustment of differences between the Pennsylvania Utilities Company and the borough of Bangor has been made, with the approval of the public service commission at Harrisburg. The chief points of the disagreement were in regard to the furnishing of steam and electricity to the borough. By the settlement all of the expenses of the borough of Bangor in its litigation with the Eastern Pennsylvania Power Company, the predecessors of the Pennsylvania Utilities Company are borne by the Pennsylvania Utilities Company. The price of arc lights, dating back about three years, is reduced from \$72 to \$50 per light, and the cost of the eighty-candle power incandescent lights is reduced from \$20 to \$16 per year.

FIRE AND POLICE

To Have Paid Department.

Austin, Tex.—After having a volunteer fire department for more than fifty years, Austin in a referendum vote has gone on record for paid fire fighters. The vote was 1,396 to 550. Clarence L. Woodward, former chief of the volunteers, will be the first paid chief.

Annual Medals for Fire Fighters and Policemen.

New York, N. Y.—Mayor Mitchel on the steps of the City Hall presented medals to twenty-five members of the fire department in recognition of meritorious acts performed last year. Nine of the medals went to individuals for courageous acts done in the performance of their duties, fifteen went to members of the second section of engine company 20 for efficiency in drills and evolutions, and the administration medal, given for the best suggestion for the improvement of the force, was presented to battalion chief George J. Kuss, who suggested the school for firemen. The firemen receiving the medals were escorted to the City Hall by the other honor men of the department, accompanied by the department band, and were received by the mayor. Fire commissioner Adamson recited the acts the firemen had performed and the mayor pinned the medals on their coats. The James Gordon Bennett medal and the department medal went to James T. Daniels, who rescued two persons under difficult conditions. The same firemen won the Bonner and department medals in 1914. These two medals were awarded this year to Frank G. Rowe, who, without a smoke helmet, descended into the hold of a ship and brought out a stevedore who had been overcome by sulphur fumes. The Trevor-Warren medal and another department medal went to David J. Oliver, who rescued a brother fireman, and the Strong medal and a department medal were given to Francis Parks, who at a fire rescued a man, bringing him down a scaling ladder from the fourth story. The Wertheim medal for personal rescue work and conduct as a commanding officer was awarded to captain Patrick J. Moran for work

in a subway fire, when he entered the smoke-filled subway and directed the work of rescue on the stalled trains. Edward J. Hartten received the Brooklyn Citizen medal for rescue work in the so-called "Diamond Candy fire," where twelve workers lost their lives. Clarence A. Walsh received the Hurley medal for rescue work at the same fire. Captain James Sherlock got the Crimmins medal for rescue work at the subway fire. The Stephenson medal went to captain Lawrence McGuire for maintaining the most efficient and disciplined company in the department for the year. The captain has had his name on the Roll of Honor five times.

New York, N. Y.—A near-tragedy marked the police parade and ceremony of the distribution of medals to honor men. The parading and maneuvers before the mayor's receiving stand had been finished, the medals awarded, the new members of the honor squad inducted and calisthenic and other drills given when the surprise of the day was staged. Very few knew of what was to happen. According to the plan of Commissioner Woods, Policeman Christopher Reilly was dressed as a tramp and was to snatch a purse from a police matron in the crowd. He was to run away followed by "Nap," his police dog, who was to catch him. Reilly went through his "stunt" in perfect order when he was attacked by a number of policemen who did not know of the plan and one of them, Patrolman Kilroy, pulled his revolver and fired twice at his comrade, who was shot severely through the mouth. While Reilly's condition is serious, he is expected to recover.

GOVERNMENT AND FINANCE

Commission Form Adopted.

Sherrill, N. Y.—The city of Sherrill has adopted a new commission form charter by a vote of: for, 84; against, 21. Ten citizens were named, five of whom will be elected on May 30, to represent the city as commissioners.

Vote for Commission Government.

Kearney, Neb.—The voters have decided that hereafter the city shall be conducted under a commission form of government and also at the same time that the Kearney Water & Electric Power company should not be allowed to do the pumping for the city under a five year contract. Only a light vote was polled upon the two propositions. The totals were as follows: For commission form of government, 473; against, 386; for the pumping for the city by the company, 219; against, 641.

Charter Amended to Increase Taxation.

Dunkirk, N. Y.—Governor Whitman has signed the bill amending the Dunkirk city charter, and Mayor J. A. Taylor has been notified. The most important result of the bill becoming a law is that the common council will be able to raise sufficient funds through taxation for public improvements which have been either held up entirely or seriously hampered through lack of money. Paving has been at a standstill because the city was without funds to pay for its share of the cost, while improvement of the dirt roads has been impossible for the same reason. Under the charter prior to the present amendment, the annual tax levy was limited to \$60,000 a year. Now the common council is authorized to levy up to one per cent. of the city's taxable assessed valuation. This year the budget will call for a tax levy of \$85,000.

Chicago's Debt.

Chicago, Ill.—The debt of the city of Chicago, December 31, 1915, was about \$30,000,000 and the fixed assets \$182,296,353.75, according to the annual report of City Comptroller Eugene R. Pike submitted to Mayor Thompson for the year ending April 1, 1916. Mr. Pike points out in his report that the legislation empowering the city to invest surplus funds in municipal bonds enables the work to go ahead without sacrificing on an unfavorable market. Since April 1, 1915, \$3,000,000 in 4 per cent bonds have been sold over the counter, and many more, the report says, could have been sold, but the object has been to provide first-class securities for the small investor rather than

to sell in large blocks. The amount of these bonds sold over the counter averaged from \$5,000 to \$10,000 a day. Mr. Pike says his effort has been to have these bonds on sale at all times for people of moderate means and that the investment insures one-third more interest on the money than if placed in savings banks. April 21, 1916, the city had \$21,113,000 invested in corporate, school, pension and library tax anticipation warrants, the largest amount so invested in the history of Chicago. The report says that the city now purchases every dollar's worth of such warrants, saving at least 2 per cent on the transactions amounting to between \$300,000 to \$400,000 to the taxpayers. The following is a statement showing the indebtedness of all taxing bodies in Cook County and the city's proportion as shown in the report of Mr. Pike:

	Total indebtedness.	City proportion.
City of Chicago.....	\$30,562,736.40	\$30,562,736.40
Cook County	9,887,500.00	9,183,476.34
Sanitary district	14,681,000.00	13,928,673.51
South Park commissioners.....	4,947,000.00	4,947,000.00
West Park commissioners.....	4,360,000.00	4,360,000.00
Lincoln Park commissioners...	2,329,000.00	2,329,000.00
Total	\$66,767,236.40	\$65,310,886.25

Want Change of Government.

Tiffin, O.—Tiffin voters have declared for a change of city government. Losing only in three precincts the charter proposal carried at the special election by a majority of 97. The total unofficial vote for the twelve precincts was 672 for and 575 against the proposal. By the same vote fifteen commissioners were chosen to frame a charter for the city's new plan of government. There are no restrictions on the type of government the commissioners are to choose. Within one year this proposed charter will be submitted to the voters for their approval or rejection. It is probable that it will be submitted at the election in November. If the people approve of the charter Tiffin will have a new form of government in 1918.

RAPID TRANSIT

City to Build Own Car Tracks.

San Francisco, Cal.—Threatening the United Railroads, the public utilities committee of the Board of Supervisors has determined to construct double tracks from the easterly portal of the Twin Peaks tunnel down Market street to Third and Kearny, and from Sixteenth street to Market on Church street, unless the company accedes to the city's terms. The terms are that the company shall give an interchangeable transfer privilege with the use of two blocks of its tracks in connecting the city's Church-street line with Castro street instead of the "sixty-fourth" division demanded by the company, and that an equitable arrangement shall be made for the use of the company's Market-street tracks as an outlet for passengers from beyond the Twin Peaks tunnel on the city's proposed line. If it becomes necessary for the city to build the Market street tracks, it may operate motor busses down Market street until such time as its own tracks are ready for use. The city has \$600,000 invested in the new Church street line and proper transportation outlet is absolutely necessary. The company threatens to bring injunctions. The money for the tracks will be taken out of earnings and if necessary a slight raise of tax rates—but no bond issues will be resorted to.

The Crowding of Jitneys.

Trenton, N. J.—Jitney buses may be crowded to the limit of their carrying capacity, without violating the traffic law of 1915, so long as passengers are not permitted to stand against the windshield or otherwise obstruct the view or interfere with the control of the jitneur. This is the ruling of Attorney General Wescott upon the question brought up by Police Commissioner Reid of Newark and construed by the attorney general at the request of Commissioner of Motor Vehicles Dill, to whom Mr. Reid applied for construction of the law of 1915, which provides that vehicles shall not be driven under conditions which endanger life and property. The ruling gives the police authority to make arrests for jitney crowding when the

vision or movements of the driver are affected by such crowding, but places the burden of determining whether these conditions are present upon the police. The attorney general says the police also have power to enforce the laws, but Mr. Reid intended to bring violations of the traffic law in this respect before the motor vehicle commissioner, because of the alleged difficulty of obtaining adequate punishment in cases affecting the traffic laws relating to motor vehicles in the local police courts.

Pittsburgh's Car Strike.

Pittsburgh, Pa.—The two-day car strike which tied up completely the whole of the Pittsburgh Railways Company's system was brought to an end by mediation following conferences between company, union and city officials, local newspaper editors and business men. Concessions were made on both sides, but the wages granted were within one cent an hour of the men's demands, making substantial increases to the extent of \$500,000 a year. No disorder at all marked the 39-hour duration of the strike, which covered all city lines, Washington and Charleroi interurban lines, the Beaver local lines and all connections.

City Upheld in Bridge Tolls Case.

New York, N. Y.—Bridge Commissioner Kracke's fight to compel the traction companies to pay tolls for the use of the East River bridges without having the amounts to be paid deducted from their special franchise taxes, has again been upheld. In a decision handed down the Appellate Division of the First Department denies the application of the New York Railways Company for a writ of mandamus to compel the proper city officials to credit the amount of their tolls for operation over the Williamsburg Bridge for the years 1912, 1913 and 1914 against the special franchise tax paid by the company, thereby coinciding with the decision of Justice Whitaker in the Supreme Court, from which the company appealed. Commissioner Kracke declares that the decision leaves not only the New York Railways Company, but the Brooklyn Rapid Transit without court standing in claiming a deduction this year.

MISCELLANEOUS

Plan to Consolidate All Repair Shops.

New York, N. Y.—At the request of Mayor Mitchel, Senator Brown introduced in the Senate at Albany a bill to reorganize the Bridge Department under the title of the Department of Plant and Structures. The head of this department is to have jurisdiction and control over the management and maintenance of the Brooklyn Bridge, the operation of the railroad on the bridge, the collection of fares and tolls, and the construction, repair, maintenance and management of all other bridges in the city. The bill also provides that the Board of Estimate may in its discretion transfer all of the work in connection "with the construction, maintenance, upkeep, and repair of buildings and structures, the repair of boats, vehicles, apparatus and equipment to the Department of Plant and Structures." At the request of the mayor, Senator Brown amended the bill so as to include in the work of the reorganized department the consolidation of all the repair shops of all the city departments under the mayor. There are seventy-one repair shops. This change was made as a result of a report made to the mayor by Fire Commissioner Robert Adamson. Commissioner Adamson investigated and found that more than \$1,000,000 a year could be saved by consolidating all of the repair shops under one department and that a much more modern and satisfactory repair service could be rendered. Commissioner Adamson suggested that such a central repair shop should be located at a point convenient to all boroughs, and it should be large enough to provide space for a central municipal storehouse, for the central testing laboratory, and for the police and fire drill squads. This consolidation should include not only the repair shops and their mechanical forces, but also the floating groups of carpenters, plumbers and other mechanics who make repairs to buildings, bridges, park structures and the like. The

present method of handling repair work is necessarily wasteful and unbusinesslike. Fourteen different commissioners now control the seventy-one repair shops. Many of these shops do the same kind of repair work, the shops are scattered haphazard about the city, and few of them are suitably housed or equipped. Each shop is operated as independently of the others as if it were a private plant. Each has its own machinery, its own mechanical force, its own electrical force, and the larger ones maintain independent trucking service, which covers the same ground daily that is covered by trucks of other departments. Sixteen of these shops occupy buildings and sites which are extremely valuable and which could be sold at substantial prices. It is estimated that the new central plant could be operated at an annual cost of \$2,987,868.92, a saving of \$1,034,526 per year. This estimate is made by John R. Keefe, chief of the Bureau of Repairs and Supplies of this department, who, after careful study of the total volume of repair work now done, believes that 2,348 mechanics and 155 clerks would be sufficient to take care of this work. The reduction in personnel, if this plan is adopted, should be made, not by dismissal, but by dropping out unnecessary positions as they fall vacant, through death, resignation, retirement, or dismissal on charges. Such a reduction could very quickly be made, the experience of this department has proved. Commissioner Adamson states that the building and site for the new consolidated shop would cost approximately \$1,500,000.

Traffic on New York Bridges.

New York, N. Y.—The Public Service Commission for the First District has received from the bridge department a report of the annual count of passengers using the various East River bridges. The count was made October 28, 1915, and covered a continuous period of twenty-four hours. The travel in each direction was counted. By far the largest traffic passed over the Williamsburg Bridge, which carried 355,561 passengers in the twenty-four hours. This was an increase of about 28,000 over the previous year, when the total was 327,134. The Brooklyn bridge showed a falling off of 50,000, the figures for 1915 being 243,617, as against 293,706 in 1914. The Queensboro bridge showed a slight increase, with 93,654, as against 89,847. The opening of the Fourth avenue subway across the Manhattan Bridge is indicated by the large increase in the traffic over that structure. Its total was 111,314, as against 52,395 the year previous. The total traffic on all bridges increased from 763,002 in 1914 to 804,146 in 1915. Following are the totals of all bridges:

	Williams- burg	Brooklyn	Manhattan	Queens- boro
Eastbound.....	180,710	125,555	54,408	47,049
Westbound.....	174,851	118,032	56,906	46,605
Totals.....	355,561	243,617	111,314	93,654
Total Traffic.....		1912.....659,591		
		1913.....742,992		
		1914.....763,082		
		1915.....804,146		

Chicago's New Pier.

Chicago, Ill.—Chicago's new \$4,000,000 municipal pier, rapidly nearing completion, is expected to be thrown open with elaborate ceremonies on or about June 15, according to an announcement by Commissioner of Public Works William R. Moorhouse. Plans are under way for beautifying 12 acres of land to be used for park purposes and approach to the pier. An imposing scheme is to be worked out, including the erection of huge columns, statuary, fountains and some form of embellishment symbolic of the lake front and its uses. The passenger and freight sections of the pier are completed and are ready to be occupied as soon as contracts have been executed with the various steamship and other transportation companies, who are expected to make use of the commercial end of the structure. The recreation section is not yet completed, but the work is being rushed as rapidly as possible. The construction of the pier has been under the supervision of the harbor and subway commission, consisting of E. C. Shankland, president; W. O. Johnson, secretary; the commissioner of public works and the city comptroller. Operation of the pier is to be in charge of a board consisting of

LEGAL NEWS

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Municipal Charters—Construction in Favor of Validity.

Pitman v. Drabelle et al.—It is settled law that the charter of a municipality or a state statute will not be held to violate the Constitution if any other rational interpretation can be given it, this being particularly true with respect to the states where the Legislature has plenary power.—Supreme Court of Missouri, 183 S. W. R., 1055.

Fire Zones—Building Ordinances—Reasonableness.

City of Monticello v. Bates.—An ordinance, merely fixing a fire zone, and providing that the town's board of trustees shall not grant permit to erect within it a building except of brick or stone, to be covered with a metal or slate roof, allows anyone to erect a building of stone or brick, and covered as provided within such district, and so is not objectionable as giving the trustees arbitrary power.—Court of Appeals of Kentucky, 133 S. W. R., 555.

Statutes—General and Special Act.

Branham v. City of Durham.—Where a general and a special statute are enacted on the same subject and are necessarily inconsistent, the special statute will prevail, as it is usually regarded as in the nature of an exception to the general statute, and this is true though the special statute superseded the general statute, unless the provisions of the general statute necessarily excludes such a construction.—Supreme Court of North Carolina, 88 S. E. R., 347.

Police Regulations—Validity—Billiard Hall.

Bryan v. City of Malvern et al.—Under Kirby's Dig. § 5593, authorizing the council of cities of the second class to make ordinances to prevent or regulate any trade, business, or vocation of a tendency dangerous to morals, health, or safety or calculated to promote dishonesty or crime, the council cannot license an act prohibited by state law which may prevent a business which is per se dangerous to morals, health, or safety, or calculated to promote dishonesty or crime, while the power to regulate is to be exercised where the business may or may not become of that nature according to the conduct. An ordinance of the city of the second class requiring an annual license fee

Commissioner of Public Works Moorhouse, chairman; City Comptroller Pike, City Harbormaster Adam Weckler, Henry V. McGurran, superintendent of the bureau of compensation; City Engineer John Ericson, Alderman James Kearns, chairman of the committee on compensation, and Alderman Harry Littler, chairman of the committee on harbors and wharves. This committee has the power to execute all leases and contracts in connection with the pier. Recently the council passed an ordinance providing for the appointment of a superintendent by civil service tests.

The cost of the pier was estimated at \$4,000,000, but Secretary Johnson states an additional \$500,000 would be required before all the work, including the beautifying of the approaches, is completed. All excursion boats now entering the river are expected to load and unload their passengers there, and much of the freight entering the river is expected to be diverted to the pier. There will be adequate railroad and street car facilities, and plans are under way for extending the underground tunnel from the loop district and railroad depots to the pier. A feature of the recreation end of the pier is to be the huge dance hall with movable seats. Band concerts are to be one of the big attractions. These can be listened to by 3,000 persons on the inside and 3,000 more on the outside galleries or combination promenades. Concessions, including restaurants and lunch counters, ice cream parlors, soda water fountains, popcorn and peanut stands and others, are expected to bring large revenues to the city. The structure is 3,500 feet long. Of this, 645 feet is to be given up to recreation space. The work was begun in the spring of 1914.

of \$600 to operate a billiard hall, and that the operator should enter into bond for \$1,000, not to operate it after 9 p. m., nor to permit any person under 18 or under the influence of intoxicating liquors to enter the hall, and to require that each person playing a game register his name in a record book, and providing that failure to comply with any of the provisions of the bond should work a forfeiture thereof, though under the guise of a regulation, is intended to suppress business and is void.—Supreme Court of Arkansas, 183 S. W. R., 957.

Application of Municipal Funds—Payment of Municipal Debt.

Slate ex rel. Poole v. City of Willow Springs.—Since the law imposes on cities of the fourth class the duty of keeping their streets and crossings in reasonably safe condition for public use and travel and to pay bonds which have been legally issued, mandamus will not lie to compel the application of the revenues available for such purposes to the payment of a judgment against the city for conversion.—Supreme Court of Missouri, Division No. 1, 133 S. W. R., 589.

Streets—Regulation—Rights of Individuals.

Pugh v. City of Des Moines et al.—While individual owners of vehicles, as motor cars, have the right to use the streets and to stop vehicles thereon for a reasonable time to enjoy such use, they have no right to park their vehicles in the streets for an unreasonable time, and thus obstruct other travelers; for, if one had such right, all should have it, and in that manner the entire street might be filled with parked vehicles.—Supreme Court of Iowa, 156 N. W. R., 892.

Establishment of Municipal Corporation—Time for Attacking Laches.

State on Inf. of Bates, Prosecuting Attorney, ex rel. Center Creek Mining Co. v. City of Charterville et al.—Where the relator owned land for a period of over 40 years after the incorporation of a municipality whose limits included his lands, and the only objection to the validity of the incorporation was made thereafter to the assessment and collection of taxes against his land, he could not have the act of incorporation declared invalid, being guilty of laches.—Springfield Court of Appeals, Missouri, 183 S. W. R., 1093.

Liability of Municipal Corporation—Negligence As to Water Plug.

Stifel et al. v. City of St. Louis.—Where a city contracted for the installation of water mains in a street, and the contractor was negligent in installing a defective fire plug in front of plaintiff's property, or such plug, after installation in good condition, became defective through handling by another city contractor, the city was liable for damage to plaintiff's property caused by leakage of water from the plug; since, whenever a city undertakes to use a public street for the construction of an electric light plant or a system of waterworks, it assumes the same responsibility as private citizens and private corporations operating a like business, and such responsibility cannot be escaped by delegation to contractors.—Supreme Court of Missouri, Division No. 1, 181 S. W. R., 577.

Police Power—Location of Stables—Constitutionality of Ordinance.

State v. Bass.—An ordinance of a town, prohibiting the building of any privy, stables, or stalls nearer a neighbor's residence than the owner's, and providing that no privy shall be constructed within 25 feet of any public street under penalty, is unconstitutional as unreasonable, not uniform, as not affording protection to all citizens alike, and not reasonably appropriate for the accomplishment of any legitimate object within the police power of the state, since its presumptive purpose is to improve the health of the town's citizens, while it puts it within the power of the owner to annoy his neighbor at will if he is willing to endure the same annoyance himself.—Supreme Court of North Carolina, 87 S. E. R., 972.

Sewers—Location—Determination by City.

City of Chicago v. Sanitary Dist. of Chicago.—Whether the location and character of sewers is useful or desirous for municipal purposes is a question solely for the determination of the city, subject to review only when there is an abuse.—Supreme Court of Illinois, 111 N. E. R., 491.

Public Improvements—Assessments—Lien.

Hardy v. Pittman.—Under the agreed statement of facts in this case, the city's claim for the pro rata cost of the assessment for street improvements attached as a lien to the property from the date of the passage of the ordinance authorizing and providing for the work.—Court of Appeals of Georgia, 88 S. E. R., 405.

Public Improvement—Resolution of Necessity—Notice.

Benshoof v. City of Iowa Falls.—Notice of the resolution of necessity to owners of property affected by an improvement is jurisdictional, and if not given the whole proceedings are invalid and void, although if the property owner has notice at some stage of the proceedings and before the assessment is in fact made, such notice of the resolution is not necessary in a constitutional sense.—Supreme Court of Iowa, 156 N. W. R., 898.

Change of Street Grade—Liability.

Turner v. City of Portland.—Where the city council, pursuant to an order, duly approved by the mayor, to change the grade of a street, entered into a contract requiring the lowering of the grade, the municipality is, under Rev. St. c. 23, § 68, declaring that when a street is raised or lowered by a person authorized, to the injury of the adjoining landowner, he may within a year have his damages assessed, liable for damages suffered by an abutting landowner.—Supreme Judicial Court of Maine, 96 A. R., 742.

Delegation of Legislative Power.

State ex rel. Nehrbass et al v. Harper, Building Inspector.—A provision of a municipal code, prohibiting the building, remodeling, or maintenance of garages, livery stables, etc., without the written consent of all real estate owners within 300 feet of the space occupied by the business proposed to be maintained, is invalid, as delegating to private individuals the legislative power vested in the city council to determine whether such structures might be maintained; property owners being allowed at their caprice to refuse to allow adjoining owners to devote their lands to such purposes.—Supreme Court of Wisconsin, 156 N. W. R., 941.

Paving—"Special Assessment"—Statute.

United Rys. & Electric Co. of Baltimore v. Mayor and City Council of City of Baltimore.—Acts 1914, c. 37, enacted in pursuance of the power of taxation and the general power of the Legislature over public highways, and imposing upon every street railway whose tracks occupy any part of any public highway the obligation to pay the cost of paving or repaving the part lying within its tracks and for two feet outside of its rails, and by section 1 imposing upon such corporations the obligation to pay the cost of such paving by the paving commission of Baltimore city or other public agency, including the removal of the old paving, etc., regardless of whether the same paving should be put both inside and outside of the tracks, and making such obligation a lien upon the property of such corporation to the same extent as taxes against their property, enforceable by the same remedies or by any other proper remedy provided by any law or ordinance, which remedies should be cumulative, undertook to impose upon the defendant street railway company a part of the burden incurred in paving the city's streets, essentially a tax or a "special assessment" levied upon its property for a local improvement; a "special assessment," as distinguished from a general tax, being a tax levied occasionally as may be required upon a limited class of persons interested in a local improvement and presumed to be benefited thereby over and above the ordinary benefit to the community in general, and founded on such principle of special benefit.—Court of Appeals of Maryland, 96 A. R., 880.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS.

Construction:

Practical Street Construction—Street Widths. Minor Residence Streets. Small amount of traffic requires only narrow roadways of 18 to 22 feet. Cost of excessive width. 6 ills., 1,500 words. Municipal Journal, April 13. 10 cts.

Local and Elastic Streets. House location more important than streets. Municipal regulation; providing total width for future, while paving for present requirements only. 6 ills., 1,500 words. Municipal Journal, April 20. 10 cts.

Philadelphia Elastic Streets. Plan recently adopted for providing width sufficient for future needs, but roadway width for the present only. 4 ills., 2,000 words. Municipal Journal, April 27. 10 cts.

Width and Allocation of Space in Roads. Determination of width for main and secondary streets, boulevards and parkways and residential roads. From a paper by F. L. Thompson. 4,000 words. The Surveyor, March 17. 40 cts.

Contract and Day Labor Road Construction Compared. Different methods of contracting are compared and also the cost and efficiency of work done by contract and by day labor. Much road work will continue to be done in small jobs. By R. W. Acton. 1,800 words. Engineering News, April 6. 15 cts.

Contract and Day Labor Systems of Doing Road Work. Discusses types of work that should be handled by each system. Methods of contracting, such as the lump sum, unit, price, cost plus percentage, etc. Profits. From a paper by R. W. Acton. 4,000 words. The Contractor, April 1. 20 cts.

How to Handle Light Excavation on Streets and Roads. The fifth of a series of articles on street and road grading. This article takes up methods of loosening and loading earth by a number of types of machines. 2,500 words. The Contractor, April 1. 20 cts.

Texas Soil Requires Paving Base to be Reinforced. Soil is black and sticky when wet and cracks when drying. 2 ills., 300 words. Engineering News, April 6. 15 cts.

Highway Construction and Natural Resources of Swain County, N. C. Describes the movement for better roads in one of the mountain counties. Types of road constructed. By K. E. Bennett. 5 ills., 1,200 words. Southern Good Roads, April. 10 cts.

Brick and Concrete Pavement Construction. Experiences with transverse joints, moisture expansion, monolithic construction, grout filler and construction in freezing weather. 2,500 words. Municipal Journal, April 27. 10 cts.

Maintenance:

Road Maintenance in The Several States. Describes the methods of maintenance in New Hampshire, Maine, Vermont, Rhode Island, Connecticut, New York, Florida, Pennsylvania, Maryland, Virginia, West Virginia, Minnesota, Illinois, Missouri, Oklahoma, California, Colorado, North Dakota, Oregon and Washington. Gives the methods employed by the state highway departments and in some cases the laws under which they work. 3 ills., 15 pages. Municipal Journal, April 6. 25 cts.

The Maintenance and Repair of New York State Highways. Describes the work of the second deputy commissioner, who has charge of maintenance and repair during 1915. By F. W. Sarr, second deputy commissioner. 6,000 words. Better Roads and Streets, April. 15 cts.

Patrol System, Gang System and Combination Patrol and Gang System of Road Maintenance in Maryland. Also

gives list of instructions and directions for maintenance for the patrolman. By H. G. Shirley, Chief Engineer, State Highway Commission. 3,500 words. Engineering and Contracting, April 12. 10 cts.

Asphalt:

Merits of Natural Asphalt Roads. Slightly condensed from a paper by Clifford Richardson. 1,500 words. Municipal Journal, April 6. 25 cts.

Merits of Refined Asphalt Roads. Slightly condensed from a paper by Le Roy M. Law. 2,000 words. Municipal Journal, April 6. 25 cts.

Asphalt Impregnated Brick. Describes method of treating shale and clay bricks by impregnating with an asphaltic preparation. Results of tests of brick before and after treatment. 1,400 words. Municipal Journal, April 6. 25 cts.

Bronx Boro Makes Its Own Asphalt Repairs and Effects a Big Saving. Erects a plant costing \$11,000 and hauls materials by motor truck. Cost is one-third less than lowest contract price. 3 ills., 900 words. Engineering Record, April 29. 15 cts.

Bituminous:

Bituminous Roads. A paper describing methods of construction of bituminous roads. From a paper by R. C. Muir. 2,500 words. The Canadian Engineer, April 6. 15 cts.

Building and Maintaining Roads with Refined Tar. An article describing methods of treating pavement with refined tar. By J. S. Crandell. 2,000 words. Canadian Engineer, April 13. 15 cts.

Bituminous Paving Plants. A paper in which the factor of the paving plant and its relation to the finished pavement is discussed. By L. Kirschbraun. 3,700 words. Canadian Engineer, April 13. 15 cts.

Construction Field Book for Bituminous Macadam Highways. Gives samples of pages. By J. T. Crawford. 4 ills., 1,500 words. Good Roads, April 1. 10 cts.

Concrete:

Recent Developments in the Building of Concrete Roads. Conclusions from the construction of 12 miles of model road. Duration of mixing; expansion joints; reinforcement; curing. From a paper by W. D. Uhler. 3 ills., 2,500 words. Municipal Journal, April 6. 25 cts.

Method and Cost of Constructing Concrete Service Test Roads at Philadelphia. Cross sections; foundation; concrete pavement; joints; bituminous surfaces; tarvia, uigte, asphalt cut-back, unionite. By William H. Connell. 3½ pages. Engineering & Contracting, April 26. 10 cts.

Further Consideration of Road Conference Committee Reports. Discusses mixing and placing of concrete, reinforcement, joint location and construction, expansion and contraction, finishing and curing and construction of shoulders and curbs. 11 ills., 12,500 words. Concrete, April. 15 cts.

Experience with Bitumen Carpeted Concrete Pavement in Ann Arbor, Mich. Describes the method of laying; maintenance, costs and present condition. From a paper by Manly Osgood, City Engineer. 4 ills., 4,000 words. Engineering & Contracting, April 19. 10 cts.

Various Aggregates in Test Concrete Road. City of Philadelphia constructs two miles of pavement on Oxford pike to make comparison of latest theories and practice. 4 ills., 1,200 words. Engineering Record, April 22. 15 cts.

36-Mile Concrete Road, Built by Day Labor, Will Link Canadian Cities. Toronto-Hamilton highway construction developed special methods for handling concrete materials by means of industrial railway system. Where paving

was 50 ft. wide, two mixers worked side by side, and a 50-ft. finishing bridge was a unique feature. By H. S. Van Scoyoc. 3 ills., 1,800 words. Engineering Record, April 15. 15 cts.

Method of Construction on the Coleman-Dupont concrete road. Describes drainage methods, grading, testing materials and inspections and reinforcing, finishing and placing the concrete. By Charles Upham, Chief Engineer. 4 ills., 2,500 words. Engineering & Contracting, April 6. 10 cts.

Concrete Road Construction in Oakland County, Mich. A practical article which goes into detail as to the methods of construction. By M. DeGlopper, County Engineer. 6 ills., 5,500 words. Municipal Engineering, April. 25 cts.

Notes on the Construction and Care of Earth, Gravel and Macadam Roads. By H. E. Bilger, road engineer, Illinois State Highway Department. 4,000 words. Better Roads and Streets, April. 15 cts.

Oiling:

Results of Road Oiling in the Middle West. Discusses oil as a dust layer and also as a means for the maintenance of rural highways. Conclusions in regard to the value of oil treatment. By T. R. Agg. 4 ills., 1,200 words. The American City, April. 50 cts.

Slag:

Quarrying, Crushing and Screening of Blast Furnace Slag. Methods of preparing material for use in road construction. 5 ills., 3,500 words. Better Roads and Streets, April. 15 cts.

Miscellaneous:

Rational Method of Selecting Types Evolved for a Comprehensive County Road System. How selection is actually made when based on five fundamental principles of the design of a road system. Equalized cost to users per year obtained by developing the design for a complete system. By W. W. Marr, Chief Engineer, Illinois State Highway Commission. 4 ills., 4,000 words. Engineering Record, April 22. 15 cts.

Office Systems for County Highway Engineers. Outlines and gives the mechanism of a satisfactory system that may be used for getting costs. By H. N. Legreid, engineer, Humboldt County, Ia. 1,200 words. American City, April. 50 cts.

The Adaptability of Various Types of Pavement for Different Kinds of Traffic as Indicated by Service Tests and Rational Design. By H. J. Fixmer. 4,000 words. Better Roads and Streets, April. 15 cts.

SEWERAGE AND SANITATION.

Treatment:

Winter Experience with the Activated Sludge Process of Sewage Treatment at Milwaukee — Sewage Disposal. By William R. Copeland, Chief Chemist. 2,000 words. Engineering & Contracting, April 26. 10 cts.

Experiences in the Application of the Activated Sludge Process to Chicago Stock Yards Sewage. From a paper by Arthur Lederer, Chemist, Sanitary District of Chicago. 1,200 words. Engineering & Contracting, April 26. 10 cts.

Milwaukee Activated Sludge Investigations. A resume of the results of experiments carried out in connection with this method of sewage disposal by the Milwaukee sewerage commission. By R. O. Wynne-Roberts. 3 ills., 3,500 words. Canadian Engineer, April 27. 15 cts.

Activated Sludge in Houston. Experiments in this method, together with Imhoff tanks, aerated contact beds and electrolytic tank. Methods and results with activated sludge. Plans adopted for permanent plant. 4 ills., 3,000 words. Municipal Journal, April 27. 10 cts.

Status of Activated Sludge Treatment. Conclusions drawn from visits to five working plants. Author considers the process, while promising, as still in the early experimental stage. By G. T. Ham-

mond. 10 ills., 2,600 words. Engineering News, April 27. 15 cts.

Disposal of Gas House Wastes. Discusses objectionable results of discharging the wastes into sewers and water courses. Their composition and methods of treatment. From a paper by Paul Hansen. 1 ill., 2,500 words. American Gas Light Journal, April 10. 10 cts.

Sewage and Its Precipitation. Facts and fallacies from laboratory and practical tests. By Reginald Brown. The Surveyor, March 10 and 17. 8 ills., 4,000 words. 40 cts. each.

Sewerage in Doncaster Rural District. Describes several sewerage works and their operation. By W. R. Crabtree. 5 ills., 3,000 words. The Surveyor, April 7. 40 cts.

Joint Sewage Disposal in California. Three adjoining municipalities combine to construct and operate a sewage disposal plant and the outfall sewer there. Details of the disposal plant. 3,700 words. Municipal Journal, April 20. 10 cts.

Sewers:
Sewer Tunnel Lined With Vitrified Brick. Tunneling and constructing a mile and a half of 4 to 7-ft. sewer. Ring centering permits removal of excavated material through sewer while being lined. By A. C. Remley, City Engineer, Appleton, Wis. 5 ills., 2,500 words. Municipal Journal, April 13. 10 cts.

Hints on the Construction of Vitrified Clay Segment Block Sewers. A description of the blocks and methods of using them. From a paper by J. M. Egan. 1,200 words. Canadian Engineer, April 6. 15 cts.

Building a Concrete Sewer in Boston During the Winter. This article describes an efficient piece of winter construction work. The use of modern machinery, the thawing out of the ground by auxiliary steam lines and the heating of the concrete made the work economical, even in a New England winter. By Daniel J. Hauer. 3 ills., 1,500 words. The Contractor, April 1. 20 cts.

Municipal Sewer Construction. War conditions brought about the circumstances described in this article on work in Moose Jaw, Sask. It shows what can be done with inefficient and inexperienced labor under the worst of weather conditions. The financial results are remarkable. 1 ill., 1,500 words. Municipal Engineering, April. 25 cts.

Miscellaneous:
Can Ground Water Be Kept Out of Sewers? Clay coverings for joints suggested and standards of leakage discussed. Charles P. Chase gives ideas as result of experience covering 25 years. 1,250 words. Engineering Record, April 1. 15 cts.

The Cause, Amount and Restriction of Infiltration of Ground Waters Into Sewers. From a paper by Charles P. Chase. 3,500 words. Engineering & Contracting, April 12. 10 cts.

A Method of Testing the Efficiency of Distribution of Sewage Sprinkler Nozzles. A paper describing experiments conducted at Cornell University and apparatus used in the study of the efficiency of distribution. By E. R. Stapley. 4 ills., 3,000 words. Canadian Engineer, April 13. 15 cts.

Sewage Filters Have Unique Distributing System. Cast iron troughs with scalloped edges placed 6 ins. apart cover the surface of stone filter at Pana. Ill. 4 ills., 1,000 words. Engineering Record, April 22. 15 cts.

Tests of Effect of Method of Bedding Upon the Supporting Strength of Drain Tile and Sewer Pipe. Discusses 9 methods of bedding. From a paper by N. J. Schlick, Drainage Engineer. 1 ill., 4,000 words. Engineering & Contracting, April 26. 10 cts.

WATER SUPPLY.

Water Supply:
Improving Schenectady's Water Works. Constructing 20,000,000-gallon reservoir, remodeling pumping station and plant and separation of high level and low level distribution systems are among the improvements. Features of reservoir floor construction and of roof reinforcement. 9 ills., 1,500 words. Municipal Journal, April 27. 10 cts.

Water Supply of Panama Canal Under Operating Conditions. Report of the hydraulic engineer of the Canal on the stages of water and amount of supply in the first year of operation. By R. Z. Kirkpatrick. 4 ills., 2,600 words. Engineering News, April 27. 15 cts.

Water Supply of the City of St. John, N. B. An historical review of the de-

velopment of the water supply of this city and a description of the present supply. By R. F. Armstrong. 1 ill., 2,000 words. Canadian Engineer, April 6. 15 cts.

Waterworks Construction in Winter in Hibbing, Minn. Some of the work done in extremely cold weather included eight 30 to 36-inch wells, a reinforced concrete reservoir holding 1,000,000 gallons, 6 miles of force main and steel tank on 120-ft. tower. By R. E. McDonnell. 4 ills., 1,100 words. Engineering News, April 13. 15 cts.

Modernizing the Manchester Waterworks. Bringing up to date a waterworks started in 1874. Old system pumped by hydraulic and steam power, new equipment for generating electricity by water and steam, and driving all pumps by electric motors. 2 ills., 3,000 words. Engineering News, April 6. 15 cts.

Middletown Water Department. Describes the water supply system of Middletown, Conn. Discusses water waste and meters. 1,800 words. Fire & Water Engineering, April 5. 10 cts.

Valparaiso Water System Improvements. Describes the pumping plant, the distribution system and the filtration plant of Valparaiso, Ind. 1,500 words. Fire & Water Engineering, April 12. 10 cts.

Purification:
Maryland Experiences in the Disinfection of Water Supply. Extent of water purification. Disinfection by hypo and liquid chlorine; results; amount of chemicals used. By R. B. Morse and H. R. Hall, Maryland State Department of Health. 4,000 words. Engineering & Contracting, April 26. 10 cts.

Theory and Practice in the Filtration of Water. Discusses mechanical filters, multiple filtration and rapid filtration. Gives conclusions as to the advantages of various methods. From a paper by Walter Clemence. 1 ill., 4,000 words. The Surveyor, April 21. 40 cts.

The Present Status of Water Purification by Rapid Sand Filters. Discusses the development of the process of filtration and describes early processes and plants. From a paper by Philip Burgess. 2,000 words. Fire & Water Engineering, April 12. 10 cts.

Operation Result of the Water Purification and Softening Plant at Fargo, N. D. Cost of furnishing water. Meter rates. By Frank Anders, City Engineer. 2,000 words. Engineering & Contracting, April 19. 10 cts.

Constant-Level Orifice Box Feeding Chemicals. Details of device for feeding chemicals to water supply system. By Weston Gavett. 1 ill., 1,000 words. Engineering News, April 27. 15 cts.

Pipe Lines:
Sooke Lake Pipe Line Successfully Operates Through a Hard Winter. A short review of the work on this pipe line with remarks as to its operation during the recent severe winter. 5 ills., 1,000 words. Canadian Engineer, April 20. 15 cts.

Proper Methods of Laying Wood Pipe. An article dealing with the development of wood pipe and describing some practical methods of laying it. By J. H. Curzon. 2 ills., 1,500 words. Canadian Engineer, April 27. 15 cts.

Notes on the Choice, Installation and Maintenance of Water Service Pipes. Outline of the preliminary reports of the committee on service pipes of the New England Waterworks Association. 1,500 words. Engineering & Contracting, April 12. 10 cts.

Shore End of Narrows Siphon Built in Open Trench Dredged to Depth of 50 ft. Steel sheeting of new design, driven by special traveler, encounters riprap and boulders; six drivers employed at one time. 5 ills., 1,500 words. Engineering Record, April 22. 15 cts.

Master Piles Eliminate Rangers in Deep Steel Sheet-Pile Trench. Staten Island end of the Narrows siphon, New York City, built under water near existing structures in specially designed open trench. 2 ills., 2,000 words. Engineering Record, April 15. 15 cts.

Manufacture and Characteristics of Wrought Iron Pipe. Describes the manufacture and the butt-weld and lap-weld process of manufacture. Materials. By W. A. Phillips. 7 ills., 1,500 words. The Gas Age, May 1. 20 cts.

Meters and Rates:
Experts Report on Meters for Chicago. Committee of engineers recommend the metering of public and big business buildings now and all consumers eventually. 700 words. Engineering Record, April 8. 15 cts.

Experience with Full Meterage of Water Supply at Miles City, Mont. Practical experience answers the question as to financial advantage in installing meters. By G. C. Fruett, City Engineer, 2,000 words. Engineering & Contracting, April 5. 10 cts.

New Water Meter Policy for New York City. Gives details of new scheme to replace antiquated system of charging. 1,000 words. Engineering News, April 6. 15 cts.

Pumping:
The Turbine Driven Centrifugal Pump Problem. Discusses the characteristics of a centrifugal pump at different speeds. Efficiency of the pump. 1 ill., 1,000 words. Fire & Water Engineering, April 12. 10 cts.

The Air Lift. A description of the air lift method of pumping water and the various factors affecting the efficiency of the apparatus. By A. H. Ford. 3 ills., 1,500 words. Canadian Engineer, April 13. 15 cts.

Segregated Well Pumping. Discussion of pumping wells which are separated to such an extent that the flow of one does not interfere with that of another. By J. W. Willis, Superintendent, Memphis Artesian Water Department. 1,200 words. Municipal Journal, April 27. 10 cts.

Reservoirs:
A Graphical Solution of the Problem of Storm Flow Through a Reservoir. Describes method of routing storms in order to reduce computations to a minimum. By A. S. Fry. 2 ills., 3,000 words. Engineering & Contracting, April 19. 10 cts.

Storage Reservoir Feeders Planned to Abate Naugatuck River Nuisance. Cooperation among New England manufacturers leads to project for water conservation in Connecticut. Involves the construction of three dams to impound 13 thousand million gallons of water. By C. H. Preston, Jr. 4 ills., 1,800 words. Engineering Record, April 29. 15 cts.

Miscellaneous:
The Valuation of Waterworks Properties. The eleventh in a series of articles. This one discusses some disputed points in waterworks valuation. By H. P. Gillette. 2,500 words. Engineering & Contracting, April 19. 10 cts.

A Large Waterworks Machine Shop at Los Angeles. A well-equipped shop for general repairs and for repairs to large motor car equipment. By B. A. Heinly. 1 ill., 1,000 words. Engineering News, April 6. 15 cts.

Grouting an Effective Remedy for Stopping Leakage in Tunnels and Shafts. The first in a series of articles summarizing the experience on the Catskill aqueduct work. Grouted tunnel under 1,500 ft. head shows little leakage. Equipment and methods are discussed. By J. F. Sanborn. 6 ills., 4,000 words. Engineering Record, April 15. 15 cts.

Grouting an Effective Remedy for Stopping Leakage During Shaft Sinking. The second article in a series describing how difficulties on Catskill aqueduct shaft were overcome by injections of sand and cement. By J. F. Sanborn. 3,500 words. Engineering Record, April 22. 15 cts.

Wet Ground Tunneling Facilitated by Grouting in Advance of Heading. Third article in a series describing aids to progress in bad ground and methods of filling cavities over arch of bore. By J. F. Sanborn. 1 ill., 3,000 words. Engineering Record, April 29. 15 cts.

STREET LIGHTING AND POWER.

Lighting:
New Street Lighting System of Milwaukee. This article describes a street lighting system which incorporates the latest scientific and practical developments and which very economically provides uniform street illumination of a high intensity. The extended survey that preceded the design of the system is summarized and some of the more original features of the plan are described. 6 ills., 3,000 words. Electrical Review, April 1. 10 cts. Part 2. Details of lamp fixtures, circuit layout, illumination characteristics and cost data. 9 ills., 5,000 words. Electrical Review, April 8. 10 cts.

Street Lighting on a Cost-of-Service Basis. An indeterminate-contract plan by which the municipality assumes responsibility for operating company's special street lighting investment. By G. W. Van Derzee. 4,500 words. Electrical World, April 1. 10 cts.

Street Lighting in Detroit. Detroit made one of the early successes in municipal street lighting, and the plant was the subject of much discussion. This article describes the work of the department, costs, etc. 5,000 words. Municipal Engineering, April. 25 cts.

Cleveland's New Street Lighting Installation. Nitrogen filled lamps in specially designed antique lanterns used with marked success in the business district; initial cost is \$228 per unit. 2 ills., 1,000 words. Electrical Review, April 29. 10 cts.

Flood Lighting. This article outlines points to be taken into consideration in designing and installation and gives the illumination data on one of the popular types of flood lighting units. By L. C. Porter. 6 ills., 3,000 words. Lighting Journal, April. 10 cts.

Power Plants:

Operation of a Small Town Generating Station. Automatic features of a 34-k.w. oil engine storage battery plant that furnishes 24-hour service to a community of 431 people. 4 ills., 1,500 words. Electrical World, April 29. 10 cts.

Diesel Engine Operation at Palo Alto Municipal Plant. The plant has shown marked economy and is in almost continuous operation. Abstracts from the report of the city engineer. 2,000 words. Power, May 2. 5 cts.

Municipal Power Plant Operated by Saskatoon, Canada. Saskatoon sells energy on a commercial basis. Last year the plant made nearly \$40,000. The fuel cost is high, but good feed water is available. By A. G. Christie. 4 ills., 3,000 words. Power, May 2. 5 cts.

Danville Municipal Lighting Plant. A municipally-operated electric light plant costing \$228,913, did a business of \$79,936 for 1914, with a profit of \$26,906. Operation. By W. O. Rogers. 8 ills., 2,000 words. Power, April 25. 5 cts.

Lethbridge Municipal Power Plant. This power plant was built a few hundred feet from a municipal coal mine. Rates range from 7 to 10 cts. per hour for lighting and 2 to 6 cts. per hour for power. Description of apparatus. By A. G. Christie. 5 ills., 3,000 words. Power, April 4. 5 cts.

The Evolution of the Municipal Electric and Water Plant of Tarentum, Pa. Rates; new equipment; the water plant. By W. S. Robinson, Boro Secretary. 2,000 words. American City, April. 50 cts.

Power Station Buildings. A review of the many things which must be considered in the design of a modern power plant building with particular reference to foundations, stacks, coal handling equipment, etc. 4,000 words. Power, April 4. 5 cts.

Miscellaneous:

Operation of a Small Ohio Transmission System. Line construction and plant operating methods used by a group of small interconnected properties. 7 ills., 3,000 words. Electrical World, April 1. 10 cts.

Iron Wire for Distribution and Transmission Lines. Present practice in the construction and operation of iron wire lines, together with test data showing characteristics and performance when used to serve small loads. 5 ills., 6,000 words. Electrical World, April 8. 10 cts.

Concrete Lighting Standard Made by Centrifugal Process. Describes types of light posts used in several cities in Southern California. When forms are filled, they are rotated to compact the mixture, thus filling all voids. By L. R. W. Allison. 3 ills., 1,200 words. Concrete, April. 15 cts.

Establishing the Electric Range in the Far West. A review of the range selling methods, rate schedules and metering practices used with success by the principal western companies. 5 ills., 3,500 words. Electrical World, April 22. 10 cts.

Developing the Electric Range Load. Some suggestions for the inauguration of a comprehensive campaign and features of the possibilities of the business. By T. L. Miles. 3,000 words. Electrical Review, April 22. 10 cts.

Laws and Regulations Regarding the Use of Water in Pan-American countries. This article not only summarizes the laws, but also notes the ways in which some of these laws are obstacles and, further, suggests possible remedies. By R. G. Brown. 15,000 words. General Electric Review, May. 20 cts.

Valuation of Water Rights for Power Companies. Some theories as to prop-

er methods of valuation. By J. P. Newell. 2,100 words. Engineering News, April 6. 15 cts.

FIRE.

Protection:

A Small but Efficient Force. Some particulars of how a part-paid fire department keeps down the fire loss in a city of 9,000 population. By F. L. Hilton, Chief, Alhambra, Cal., Fire Department. 4 ills., 500 words. Fireman's Herald, April 29. 5 cts.

Oklahoma City's Fire Department. Report of National Board of Fire Underwriters on conditions existing in Oklahoma City. 2,500 words. Fireman's Herald, April 29. 5 cts.

A Modern Fire Department. Description of methods at Springfield, Mass.; standardization of equipment; training school; repair shop. 2,000 words. Fireman's Herald, April 22. 5 cts.

Annual Fire Report of Richmond. Describes apparatus in service and the methods of fire prevention inspection; chief's recommendations. 2,500 words. Fire & Water Engineering, April 5. 10 cts.

Report on the Elizabeth Fire Service. Describes apparatus, fire alarm system and water supply; recommendations for improvements. 1,500 words. Fire and Water Engineering, April 19.

Foam-System Installation for Fighting Oil Fires. Protection of oil storage tanks from fire by use of foam extinguishers. Details of plant installed at Coalinga, Cal. Formulas for solutions. By C. P. Bowie. 6 ills., 2,800 words. Engineering News, April 27. 15 cts.

To Safeguard Schools. Committee formed draft bills to prevent disastrous fires in schools. Many fire chiefs and other experts assisted in making this a model enactment. 1,500 words. Fireman's Herald, April 8. 5 cts.

Miscellaneous:

Efficiency Record System. Berkeley, Cal., the latest to abolish fines and inaugurate plan of credit and discredit marks. Full text of the rules is given. 1,500 words. Fireman's Herald, April 29. 5 cts.

Fire Department Ambulance Corps. Discusses organization and management; method of instruction; first aid. By L. Crawford. 1,500 words. Fire & Water Engineering, April 26. 10 cts.

New York Fire College Extension Course. Questions presented and the answers thereto as officially promulgated for the instruction of members of the department. First installment. 1,500 words. Fireman's Herald, April 8. 5 cts. Second installment, 1,500 words. Fireman's Herald, April 15. 5 cts. Third installment, 1,500 words. April 22. 5 cts.

General Consideration of the Need of Co-operation Between Communities in Case of Fire. Standardization of hydrants and couplings. By F. M. Griswold. 3 ills., 2,000 words. Fire & Water Engineering, April 5. 10 cts.

Setting and Care of Fire Hydrants. Describes the two types of hydrants and discusses the spacing, setting and inspection of them. Describes the methods of inspection in several cities; cost. 11 ills., 3,000 words. Fire & Water Engineering, April 5. 10 cts.

STREET CLEANING AND REFUSE DISPOSAL.

Street Cleaning in Milwaukee. (Continued from the March issue.) This covers cost of flushing and sprinkling and of pick-up service. Hauling ashes and rubbish and modern methods of handling. 3 ills., 2,500 words. Better Roads and Streets, April. 15 cts.

Snow Removal by Contract in New York City. An account of the methods and organization of the department for cleaning snow from the street. By Geo. D. Steele. 5,000 words. Better Roads and Streets, April. 15 cts.

5-Ton Garbage Reduction Plant Yields Profit to the City. Test of the new works at Pontiac, Mich., indicates an absence of odors. Gross revenue is \$14.70 per day, while cost of reduction is \$11. By George R. Bascom. 1,300 words. Engineering Record, April 22. 15 cts.

CITY PLANNING.

The Principles and Position of Town Planning. States the need for and the tendencies in town planning. Zone system and commercial districts; limitations of houses per acre; arterial roads. By W. R. Davidge. 3,000 words. The Surveyor, April 21. 40 cts.

Town Planning: Its Development and Utility. Neglect in modern times; economy. From a paper by J. W. Cockrill. 3,000 words. The Surveyor, April 14. 40 cts.

Town Planning: With special reference to the Doncaster District. Discusses general development plan. Road sections for elastic streets. By Percy Morris. 3 ills., 2,500 words. The Surveyor, April 7. 40 cts.

GOVERNMENT AND FINANCE.

How Buildings Were Appraised in Revaluation of Real Property of Los Angeles. Valuation of all buildings in the county was made in 10 months, together with revaluation of land. Unit foot estimate made in the field. Different percentages of depreciation applied to fit the various cases. Discussion of life length. By J. C. Bannister. 3 ills., 4,500 words. Engineering Record, April 8. 15 cts.

Assessment Methods in California Cities. Describes the methods employed by assessors in several cities; percentages of full value assessed in each city. 1,500 words. Municipal Journal, April 27. 10 cts.

The Municipal Supply Department. The second of a series of articles on the handling of supplies for municipal departments. This is devoted to the storekeeper and storehouse. By H. M. Foster. 2,500 words. Municipal Engineering, April. 25 cts.

A Successful Stores Keeping System. While this article explains the operations of a storekeeping system especially evolved for a large central station, it is equally adapted to the stores department of any industrial enterprise. It is simple and accurate. By Charles Kist. 8 ills., 2,000 words. The Engineering Magazine, April. 25 cts.

Office Methods for a Small Contracting Business. Discusses journal and ledger entries, depreciation accounts, vouchers, invoices, pay rolls and orders; labor and material costs; overhead and final costs. By C. M. Cobb. 1 ill., 4,500 words. Engineering & Contracting, April 5. 10 cts.

Filing Correspondence in a Municipal Department. Describes the methods in use in the New York Board of Water Supply. By Robert J. Fee. 2,400 words. Engineering News, April 27. 15 cts.

BRIDGES

Some Design Features of a Reinforced Concrete and Steel Viaduct Between Portland and South Portland, Me. 5 ills., 1,500 words. Engineering & Contracting, April 19. 10 cts.

Queens Boulevard Viaduct, New York City. Describes the construction of a long steel and concrete highway bridge. Is 4,271 ft. long and carries on one deck three tracks of the Rapid Transit Railroad and two sidewalks. 6 ills., 1,500 words. Contracting, April. 10 cts.

Calgary's Center Street Bridge. Two-deck, reinforced concrete bridge with 10 arch spans and having a lower deck for automobiles only. Describes details of design and mixing and distribution of concrete. All the work was done by city employees. By W. E. Hardenburg. 3 ills., 2,000 words. Municipal Journal, April 20. 10 cts.

Reversible Falls Steel-Arch Bridge of 565-ft. span. Details of the framing of new highway bridge of modern design at St. John, N. B. 7 ills., 800 words. Engineering News, April 27. 15 cts.

Reconstruction of Mississippi River Bridge at Keokuk. The new spans are built on the old piers, but the bridge had to be kept open for traffic while the work was in progress. 6 ills., 1,700 words. Engineering News, April 13. 15 cts.

American Railroad Bridges. A paper describing the evolution of the American railroad bridge up to the present time. By J. E. Greiner. 4 ills., 2,900 words. Canadian Engineer, April 27. 15 cts.

How the Forest Service Bridges the More Remote Stream Crossings. Inexpensive suspension bridges are built across mountain streams of the Northwest under difficulties. 4 ills., 2,000 words. Engineering Record, April 8. 15 cts.

Painting and Maintaining Steel Highway Bridges. Discusses the condition of the steel surface and the relation of it to the life of the paint. Kinds of paint suitable. Maintenance methods on steel bridges. By George Hogarth, Chief Engineer of Highways, Ontario, Canada. 3,000 words. Engineering & Contracting, April 19. 10 cts.

(Continued on page 667).

NEWS OF THE SOCIETIES

Calendar of Meetings.

May 9-11.—NATIONAL FIRE PROTECTION ASSOCIATION. Twentieth Annual Convention, Chicago, Ill. Secretary, Franklin H. Wentworth, 87 Milk St., Boston, Mass.

May 9-11.—STATE FIREMEN'S ASSOCIATION OF TEXAS. Annual convention, parade and tournament, New Braunfels, Tex.

May 10, 11.—MICHIGAN GOOD ROADS ASSOCIATION. Eighth annual meeting, Grand Rapids, Mich. President, Philip T. Colgrove, Hastings, Mich.

May 10-12.—INTERNATIONAL ASSOCIATION OF POLICEWOMEN. Annual Convention, Indianapolis, Ind. President, Alice Stebbins Wells, Los Angeles, Cal.

May 10-17.—NATIONAL CONFERENCE OF CHARITIES AND CORRECTIONS. Annual conference, Indianapolis, Ind.

May 15-16.—ARIZONA GOOD ROADS ASSOCIATION AND STATE ASSOCIATION OF HIGHWAY ENGINEERS. Annual meeting, Phoenix, Ariz.

May 17-20.—SOUTHWESTERN ELECTRICAL AND GAS ASSOCIATION. Annual convention, Galveston, Tex. Secretary, H. S. Cooper, Slaughter Bldg., Dallas, Tex.

May 22-26.—NATIONAL ELECTRIC LIGHT ASSOCIATION. Thirty-ninth Annual Convention, Chicago, Ill.

May 22-27.—NATIONAL EXPOSITION OF SAFETY AND HEALTH. Second annual exposition, New York, N. Y. Director-General, The American Museum of Safety, 14 West 24th Street, New York.

May 23-26.—OKLAHOMA STATE FIREMEN'S ASSOCIATION. Annual convention, parade and tournament, Cushing, Okla.

May 31-June 2.—NEW YORK STATE CONFERENCE OF MAYORS. Annual conference, Syracuse, N. Y.

May 31-June 2.—NATIONAL ASSOCIATION OF COMPTROLLERS AND ACCOUNTING OFFICERS. Annual convention, Syracuse, N. Y.

June 5-7.—NATIONAL CONFERENCE ON CITY PLANNING. Eighth annual conference, Hotel Statler, Cleveland, O. Secretary, Flavel Shurtleff, 19 Congress St., Boston, Mass.

June 5-9.—AMERICAN WATER WORKS ASSOCIATION. Thirty-sixth annual convention, Hotel Astor, New York City. Secretary, J. M. Diven, 47 State street, Troy, N. Y.

June 12-16.—SOUTH DAKOTA STATE FIREMEN'S ASSOCIATION. Annual convention, Yankton, S. D.

June 13-15.—MINNESOTA STATE FIRE DEPARTMENT ASSOCIATION. Annual convention, Chisholm, Minn.

June 14-16.—UNION OF SASKATCHEWAN MUNICIPALITIES. Annual convention, Swift Current, Sask. Secretary, W. F. Heal, Moose Jaw, Sask.

June 14-17.—AMERICAN INSTITUTE OF CHEMICAL ENGINEERS. Eighth semi-annual meeting, Cleveland, O. Secretary, I. C. Olsen, Cooper Union, New York City.

June 15, 16.—OHIO SOCIETY OF MECHANICAL, STEAM AND ELECTRICAL ENGINEERS. Convention, Cleveland, O. President, Joseph L. Skeldon, Toledo.

June 20-22.—SOUTH CAROLINA STATE FIREMEN'S ASSOCIATION. Annual convention, Orangeburg, S. C.

June 21-23.—TRI-STATE WATER AND LIGHT ASSOCIATION OF THE CAROLINAS AND GEORGIA. Annual Convention, Isle of Palms, S. C. Secretary-treasurer, W. F. Stieglitz, Columbia, S. C.

June 27-30.—IOWA STATE FIREMEN'S ASSOCIATION. Annual convention, De Witt, Ia.

June 27-30.—AMERICAN SOCIETY OF CIVIL ENGINEERS. Annual meeting, Pittsburgh, Pa. Secretary, Charles Warren Hunt, 220 West 57th St., New York, N. Y.

June 28-30.—MICHIGAN LEAGUE OF MUNICIPALITIES. Annual meeting, Battle Creek, Mich.

June 27-July 1.—AMERICAN SOCIETY FOR TESTING MATERIALS. Annual meeting, Atlantic City, N. J. Secretary, Edgar Marburg, University of Pennsylvania, Philadelphia, Pa.

July 11-13.—MUNICIPAL LEAGUE OF INDIANA. Annual meeting, Goshen, Ind.

July 25-27.—CENTRAL NEW YORK VOLUNTEER FIREMEN'S ASSOCIATION. Annual convention, Seneca Falls, N. Y. Secretary, Stewart W. Smythe, Cortland, N. Y.

Aug. 7-9.—CITY MARSHALS' AND POLICE CHIEFS' UNION OF TEXAS. Annual convention, Houston, Tex.

Aug. 8-11.—DOMINION ASSOCIATION OF FIRE CHIEFS. Annual convention, Windsor, Ont. Secretary, James Armstrong, Kingston, Ont.

Aug. 21-27.—PACIFIC COAST ASSOCIATION OF FIRE CHIEFS. Annual convention, San Diego, Cal.

Aug. 20-31.—LEAGUE OF CITIES OF THIRD CLASS IN PENNSYLVANIA. Seventeenth Annual Convention, Johnstown, Pa. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

Aug. 29-Sept. 1.—INTERNATIONAL ASSOCIATION OF FIRE ENGINEERS. Annual convention, Providence, R. I. Secretary, James McFall, Roanoke, Va.

Sept. 6-9.—LEAGUE OF AMERICAN MUNICIPALITIES. Annual convention, Newark, N. J.

Oct. 9-13.—AMERICAN SOCIETY OF MUNICIPAL IMPROVEMENTS. Twenty-third Annual Convention, Robert Treat Hotel, Newark, N. J. Secretary, Charles Carroll Brown, 702 Wulsin Building, Indianapolis, Ind.

Oct. 16-21.—NATIONAL SAFETY COUNCIL. Fifth Annual Safety Congress, Detroit, Mich. Secretary, W. H. Cameron, Continental and Commercial Bank, Chicago, Ill.

Feb. 5-12, 1917.—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics' Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York City.

National Assembly of Civil Service Commissions.

The model civil service law on which Secretary Doyle of the United States civil service commission and associates have been at work is now in shape to be presented to the National Assembly of Civil Service Commissions in Ottawa, Canada, on June 14.

The intention is that this suggested law should be urged for adoption or made the model for civil service laws throughout all the states, a task to be undertaken by advocates of civil service. The draft prepared embodies the provisions and regulations of the measure considered a year ago, with such minor changes and improvements as the committee thought would add to its merits.

It would place under civil service all branches of state, county and municipal government, with certain specified exceptions, these exceptions being all officers elected by popular vote, judges and court officers, officers and employees of a district having fewer than fifty employees and a monthly payroll of less than \$5,000, temporary and special employees for work that could not be done by regular employees and men of the military service.

The operation of the system is to be by civil service commissions, state, county and municipal, consisting of one or three members. State civil service commissioners would be paid not less than \$4,000 a year and expenses; the minimum for others would be \$1,000.

The civil service commissioners, state and local, according to the proposed law, would be selected and ap-

pointed after examination in the same manner as all other public servants coming under that law's provisions and they would hold office during good behavior and be subject to removal after hearing and trial before competent authority. This, it is urged, would insure that the commissioners would be "out of politics" and be necessary for the success of the civil service system.

Rules for the standardization of the service, for promotions, removals, hearing of complaints, penalties and all the other workings are provided. There is the customary barring of partisan political activity, passive membership in clubs being all that is to be allowed.

Along with the model law the acting committee also submits a tentative draft of a constitutional amendment which would be introductory to the establishing of the civil service by the states.

Members of the committee besides Secretary Doyle were Robert Catherwood, Charles G. Morris, C. H. Bryson, William B. Moulton and Ralph L. Peck, representing the associations of Connecticut, Ohio, Illinois and of Cook county.

New York State Conference of Mayors.

The seventh annual Conference of Mayors and Other City Officials of New York State will be held at Syracuse, N. Y., May 31, June 1 and 2. At the same time the National Association of Comptrollers and Accounting Officers will hold their convention at Syracuse, while the city itself will celebrate Municipal Day on June 2.

The program of the Convention of Mayors follows:

Wednesday, May 31, 10.00 A. M.—Registration of delegates, Hotel Onondaga; 11:00 A. M.—Meeting of Advisory Committee; 12:00 A. M.—Meeting of Bureau Council.

At the first session there will be a joint meeting of the Conference and of the National Association of Comptrollers and Accounting Officers. Samuel Carlson, mayor of Jamestown, will preside. The address of welcome will be delivered by W. R. Stone, mayor of Syracuse, following which will be the annual address by Rosslyn M. Cox, president of the Conference, and Thomas F. Boyle, president National Association of Comptrollers. The State and Municipalities will be the subject of an address by Governor Charles S. Whitman.

The second session, held Wednesday evening, will also be a joint meeting of the Conference and the National Association of Comptrollers and Accounting Officers, with Edwin W. Fiske, mayor of Mt. Vernon, presiding. The addresses will include "Reducing City's Army of Unemployed" (report of committee), Henry W. Hoffman, mayor of Elmira; "New York State's Co-operative Plan for Securing Municipal Data," James T. Lennon, chairman, Conference Bureau Council;

"Uniform Accounting System for Third Class Cities," Frederick G. Reusswig, Deputy Comptroller, State of New York; discussion opened by Mayor D. W. Wilbur, Poughkeepsie.

Thursday, June 1, 9.30 A. M.—Third session, Walter Butler, mayor of Saratoga, presiding. "Activated Sludge Method of Sewage Disposal," T. Chalkley Hatton, Sewerage Commission of Milwaukee; discussion opened by Chief Engineer, Glenn D. Holmes of the Syracuse Intercepting Sewer Board and John A. Giles, Commissioner of Public Works, Binghamton; "Uniform Municipal Health Budgets," Dr. Lindsay Williams, Deputy Health Commissioner State of New York; discussion opened by Dr. Francis E. Fronczak, Commissioner of Health, Buffalo, and Dr. Horace M. Hicks, Health Officer, Amsterdam.

Julius Frank, mayor of Ogdensburg, will preside at the fourth session, held Thursday afternoon. Papers will be read as follows: "Exemptions of Real and Personal Property from Taxation," Martin Saxe, president Tax Commission, State of New York; discussion opened by Mark I. Koon, mayor of Auburn, and F. M. Thompson, mayor White Plains; "The Attitude of State Department of Education Toward City Schools," Dr. John Finley, Commissioner of Education, State of New York; discussion opened by J. Purroy Mitchel, mayor of New York City, and John Hoag, mayor of Salamanca.

The fifth session, held Thursday evening, will also be a joint meeting of the Conference and the National Association of Comptrollers and Accounting Officers. George R. Lunn, mayor of Schenectady, will preside. Addresses will include: "New York State's Proposed Uniform Bond Law," Edw. D. Osborne, Comptroller of Rochester and former president of the National Association of Comptrollers and Accounting Officers; discussion opened by E. S. Griffing, mayor of New Rochelle, and Corporation Counsel Arthur L. Andrews of Albany; "Pay-as-You-Go Policy for Cities," William A. Prendergast, Comptroller City of New York.

The sixth session will be held Friday morning, with Benjamin Rand, mayor of North Tonawanda, presiding. Papers will include: "Standard Units for Comparing Municipal Improvements," A. Prescott Folwell, chairman, Committee on Standard Forms of American Society for Municipal Improvements; discussion opened by City Manager O. E. Carr, Niagara Falls, and Palmer Canfield, mayor of Kingston; "Limiting the Heights of Buildings and Restricting the Use of Property," Lawson Purdy, president, Department of Taxation and Assessment, New York city.

American Association of Engineers.

The first annual convention of the American Association of Engineers will be held in Chicago May 9 and 10.

Two afternoon informal sessions will be held in the rooms of the Western

Society of Engineers, 1735 Monadnock block. To these and to the annual dinner held at the City Club all engineers interested in promoting the economic and social welfare of engineers are invited.

No long papers will be permitted at the informal sessions, but discussions of several vital subjects will be opened by prominent engineers.

(Continued on page 669.)

PERSONALS

Floy, Henry, an electrical and mechanical engineer who became known as the first to install a 25,000-volt high-tension electric transmission underground, died suddenly May 4 at his home in New York city in his forty-ninth year.

He was born in Elizabeth, N. J., and after being graduated from Wesleyan University with the degrees of A. B. and A. M., attended Cornell University, where he received the degree of M. E. in 1891. During 1892-98 Mr. Floy was associated with the Westinghouse Electric and Manufacturing Company in Pittsburgh, Chicago and Minneapolis. In 1898 he came to New York and was associated with Professor R. C. Carpenter of Cornell as consulting engineer. Three years later he severed his connection with Professor Carpenter, and since that time was in business for himself.

Mr. Floy was the author of several notable works on electrical subjects, and was a member of the jury of awards at the St. Louis exposition; a fellow of the American Institute of Engineers, and a member of the American Society of Civil Engineers, the National Electric Light Association, the American Electric Railway Association, the Illuminating Engineering Society, the New York Electric Society, and the Wesleyan University Alumni Association. He was author of the following books: "Valuation of Public Utility Properties," "The Colorado Springs Lighting Controversy," "High Tension Underground Electric Cables" and "Value for Rate Making."

Boyd, J. M., has been appointed chief of police of Lawrence, Kas., succeeding C. M. Fisher, who resigned.

Boehin, W. D., for many years a member of the fire department of Sterling, Ill., has been elected chief of the department.

Beckley, L. D., civil engineer, announces the opening of an office at 2931 Woodward Ave., Highland Park, Mich., at which he will engage in general engineering work, including especially municipal engineering, sewerage, water works, paving, surveys, subdivisions, reports, plans, specifications and supervision.

Harkness, Le Roy T., has been transferred by the Public Service Commission for the First District from the position of assistant counsel in the legal department of the commission to

administrative and executive charge of all rapid transit matters, responsible directly to the commission. At the same time his salary was increased from \$7,500 to \$10,000 per year.

Irwin, John W., has been appointed city engineer and August Klockow superintendent of streets of Mt. Clemens, Mich.

Maguire, Dr. John D., has been appointed health officer of Lexington, Ky. Maltbie, Milo R., formerly public service commissioner, has been appointed city chamberlain of New York city, succeeding Henry Bruere, who resigned some time ago.

Morgan, R. D., has been appointed city engineer of Temple, Texas.

Taylor, Henry W., consulting engineer of Albany, N. Y., who was recently injured in an automobile accident, is slowly recovering.

Tillson, George W., Henry G. Shirley and Arthur H. Blanchard, a commission of engineers appointed by the Wilmington Chamber of Commerce, have recently submitted a report on the administration, construction and maintenance of highways which are under the jurisdiction of the levy court of New Castle County, Delaware.

The following have been elected in Texas:

Texas City—Carl Nessler, mayor, and Henry U. Kilgore and C. P. Paul, city commissioners.

Magnolia Park—W. E. Monk was elected mayor; O. T. Wallace, G. W. Schramm and W. D. Roberts, aldermen.

Nacogdoches—George H. Matthews was re-elected mayor, and G. H. King and Zeno Cox, Jr., aldermen.

Bastrop—J. N. Jenkins, mayor; O. P. Jones and A. Griesenbeck, aldermen, and Dyer Moore, city attorney.

Coleman—R. E. L. Zimmerman, mayor; H. R. Stockweather and C. S. Jackson, commissioners.

Cuero—Mayor, William Milligan; J. B. Lewis, city engineer; S. A. Crager, city attorney.

Ector—O. M. Luton, mayor; C. T. Miller, marshal; aldermen, D. F. Linton, L. E. Orndorff, J. C. Alderson, J. B. DeWitt and W. H. Gilley.

Rusk—City marshal, E. C. Martin; city attorney, R. A. W. Barrett; aldermen, A. M. Vining, J. L. Summers, W. H. Wallace and T. H. Singletary, Jr.

Harlingen—Mayor, Miller V. Pendleton; H. A. Gibbs, A. H. Weller and J. M. Denton, aldermen; H. D. Seago, city secretary, and Oscar Morris, marshal.

Gainsville—Sid Loving, marshal; Bob Bean, re-elected tax collector; Shearon Bryan, city secretary.

Uvalde—W. J. Pilgreen, mayor; D. M. Holsomback, recorder; R. L. Thompson, G. W. Brasshear and A. M. Crisp, aldermen, and I. L. Martin, Jr., city attorney.

San Marcos—City tax collector and assessor, Woods McKie; marshal, Sam Perkins; aldermen, W. E. Allison, E.

(Continued on page 670.)

MUNICIPAL INDEX

(Continued from page 664.)

Impact Formulas for Highway Bridge Design. A brief history of two railway bridge impact formulas, showing that they are unsuited for highway bridge design. The first of two articles on this subject. By E. H. Darling. 1 ill., 3,500 words. April 6. 15 cts. Part 2 is a discussion of the Dominion government and Ontario government impact formulas with suggestions as to simplification. By E. H. Darling. 1 ill., 3,000 words. Canadian Engineer, April 13. 15 cts.

Temperature Stresses in a Series of Concrete Girder Spans Under Different Conditions of End Support. From a paper by T. D. Gregg. 2 ill., 1,200 words. Engineering & Contracting, April 5. 10 cts.

Standard Concrete Abutments for Michigan Bridges. Describes the types of abutments in use by the Michigan State Highway Department. By C. V. Dewart. 3 ill., 800 words. Engineering News, April 20. 15 cts.

Concrete Balustrades Enhance Appearance of Bridges. Ornamental sidewalk railways built on bridges in Toronto are described. Molding and finishing methods given. By L. M. Edwards. 5 ill., 1,200 words. Engineering Record, April 22. 15 cts.

STRUCTURAL MATERIALS.

Gravel as an Aggregate for Concrete. Specifications for gravel have never been written, that material being treated as though it was broken stone, whereas it is a very different material and requires different treatment to obtain best results. This is a study of the data regarding gravel and sand for concrete. By H. H. Scofield and C. C. Brown. 3,500 words. Municipal Engineering, April. 25 cts.

The Relation of Size of Sand Grains to Strength of Mortar and Concrete. From a paper by C. N. Chapman, engineer of tests, Westinghouse, Church, Kerr Co. 2 ill., 2,000 words. Better Roads and Streets, April. 15 cts.

Economy of Continuity in Reinforced Concrete. Investigation into conditions of economy in designing continuous concrete girders for bridge work. By R. J. Roark. 3 ill., 2,250 words. Engineering News, April 27. 15 cts.

Forms for Concrete Work—Some Factors to be Considered in Their Design. Economical design and construction of form work is an important factor in securing a profit on a job. This article discusses some points of interest. By R. A. Sherwin. 6 ill., 7,500 words. Concrete, April. 15 cts.

Screening and Concrete Plants for Building Use Gravel from Cellar Excavation. Building in Cincinnati completed rapidly with economical layout including wheels trestles for support of

chutes. By W. R. Howard. 4 ill., 2,500 words. Engineering Record, April 8. 15 cts.

Tunnel Muck Turned Into Concrete Lining Behind Heading. Mounted screening apparatus puts all material below 4 inches into pneumatic mixer. Without added fine aggregate, concrete is placed in forms. 9 ill., 3,500 words. Engineering Record, April 29. 15 cts.

Properties of Building Stones. Discusses varieties of American stone which are especially suitable for building. 1 ill., 1,500 words. Stone, April. 15 cts.

MISCELLANEOUS.

Steep Grade on San Francisco's Street Railway Overcome. Describes the solution of a grade problem. 1 ill., 900 words. Engineering News, April 6. 15 cts.

Comparison of Team and Tractor for Hauling Gravel. This is a comparison by demonstration of hauling costs by animal and by motor power. It shows the connection of the methods of loading and unloading with economy of hauling. The motor truck requires better loading facilities. By O. L. Kipp. 2,500 words. Municipal Engineering, April. 25 cts.

Street Railway Obligations to Repair and Maintain Public Ways. Recent report of Massachusetts Public Service Commission giving practices in several states. By W. B. Conant. 1,000 words. Municipal Journal, April 13. 10 cts.

Small Irrigation Canal Lined With Concrete to Prevent Seepage Water Loss. Seepage losses were reduced from 51 per cent to 15 per cent on the Okanogan project in Washington. Construction details, including grade, excavation, organization and use of templates. By C. E. Edwards. 2 ill., 2,500 words. Engineering Record, April 15. 15 cts.

Small Irrigation Canals Lined With Concrete to Prevent Seepage Water Loss. Part 2 of the article gives details of construction and cost of work. By C. E. Edwards. 1 ill., 2,500 words. Engineering Record, April 22. 15 cts.

City Improvement Records on 4x6-in. Cards. City Engineer of Elgin, Ill., evolves system to enable him to answer questions instantly on progress of special assessment work. 2 ill., 1,500 words. Engineering Record, April 8. 15 cts.

National Defense—For Engineer and Contractor. The sixth in a series of articles. This one describes methods of military map making and topographical surveying for tactical uses. By Major P. S. Bond, U. S. Army. 4 ill., 4,000 words. Engineering Record, April 8. 15 cts.

Precise Leveling by Geodetic Survey. A review of the work being done by this bureau of the Canadian government in making a precise system of leveling. By F. B. Reid. 4 ill., 3,000 words. Canadian Engineer, April 20. 15 cts.

Precise Leveling by the Geodetic Survey. Describes the methods and discusses the allowable error. Instructions for leveling under various conditions. By F. B. Reid. 1 ill., 2,250 words. Canadian Engineer, April 27. 15 cts.

Pittsburgh's Smoke 75 Per Cent Cured. Progress of smoke prevention in the smokiest city. 2 ill., 600 words. Engineering News, April 6. 15 cts.

More Trouble at Austin Dam. Notes on some further disturbances at the dam across the Colorado river at Austin, Texas. 3 ill., 1,100 words. Engineering News, April 6. 15 cts.

A Modern Crushing Plant. Describes the complete and modern equipment of the Temescal Rock Co. at Corona, Cal. 2 ill., 1,000 words. Stone, April. 15 cts.

Styles and Sizes of Concrete Mixers for Contractors. The second of a series of articles on the selection and operation of concrete mixers, showing practical details of such machines. This article deals with styles and sizes and the power used. 2,500 words. The Contractor, April 1. 20 cts.

Types and Costs of Slack Cable Excavator Plants. A description of plant and methods used in excavating with this equipment, with costs for plant and operating. 1,700 words. Canadian Engineer, April 6. 15 cts.

Loading Wagons at Street Level on Basement Excavation. Traction shovel with ditcher bucket works from ground level, eliminating incline and snatch teams. 3 ill., 1,500 words. The Contractor, April 1. 20 cts.

Park Planting for Prairie Towns. Discusses trees suitable for planting along streets; width of streets; public square; treatment. By L. R. Moyer. 2,000 words. Minnesota Municipalities, February. 25 cts.

Municipal Tree Planting and Lot Cleaning. What Glendale, Cal., has done toward municipal tree planting and regulation. 1 ill., 2,000 words. Pacific Municipalities, April. 25 cts.

Comparison of Wood and Concrete for Use in Irrigation Structures. Gives ratio of cost of concrete and wood and number of cubic yards of concrete which are equivalent to 1,000 ft. board measure. Maintenance and depreciation. 5,500 words. Engineering & Contracting, April 12. 10 cts.

Flood Protection in Indianapolis. The early completion of the first flood protection work in Indianapolis will make that city the first to complete its protection. The variety of work and the ingenuity exercised in solving the numerous special problems make this work of interest. 9 ill., 3,000 words. Municipal Engineering, April. 25 cts.

Drinking Fountains and Watering Troughs. Describes several types of each. 4 ill., 1,000 words. American City, April. 50 cts.

New York Engineer Positions Standardized. Report of committee of New York State Senate on Civil Service. 2,100 words. Engineering News, April 6. 15 cts.

BOOK REVIEW

THE AMERICAN ROAD, by James I. Tucker, Professor of Civil Engineering, University of Oklahoma; 235 pages, illustrated. Published by the author. Price, \$1.67.

This book, which deals exclusively with the earth road, is brought out with a double purpose. It is meant to assist in the enlightenment of the public by presenting simple facts essential to sound practice in road maintenance and construction. Technical terms of all sorts are avoided and the material is presented in a form understandable to the average country road official or citizen. The second purpose of the book is to furnish the material for a brief correspondence course for actual road builders, the information being of the type offered in the Extension Departments of many colleges and universities and in the short courses.

While the book contains much matter of interest and value to road engineers in general, it is aimed chiefly to assist that group who, though having a limited technical education, may be engaged in road work. A perusal of this book ought certainly to help make their services more efficient.

Another class to which the book will appeal is that important group of persons who actually build the roads and direct the labor of construction and maintenance. A fourth, and very important group, consists of the local officials, such as county boards or commissioners. Their intelligent assistance and support would permit road engineers to do more and better work with the funds available than is now possible. This deficiency of results is often brought about by ignorance or antagonism from such board members who are unaware of the existence of road building principles. Last of all the book is intended for the users of

roads, the American public. It will give these people such an outline of road problems that they will be better fitted for judging the capabilities of their officials.

As before stated the book considers only the simpler kinds of roads. Chapters are devoted to Road Finance and Administration, Earth Road Construction, Stone and Gravel Roads, Sand Clay Roads, Oils, Maintenance and Construction, Bridges and Culverts and Earthwork. It emphasizes the importance of having the services of a competent engineer. Actual examples of failure due to lack of proper engineering knowledge are cited in many places. Sections and specifications for various types of roads and standard culverts are given.

The book is neatly and serviceably bound and printed. Most of its illustrations are excellent and every picture is calculated to tell a real story very effectively.

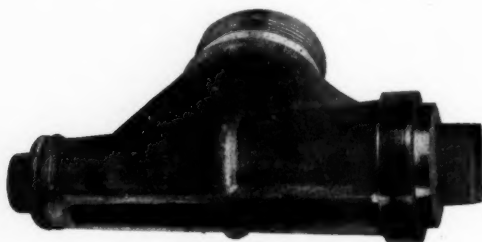
NEW APPLIANCES

Describing New Machinery, Apparatus, Materials and Methods and Recent Interesting Installations.

STREET CLEANING NOZZLE.

Easily Regulated for Flushing or Sprinkling.

It is becoming increasingly evident to street cleaning officials that the sprinkling and flushing of streets has not yet been worked out to high efficiency and that there is still much waste both in wear of pavement and in quantity of water. Flushing with too much pressure tends to have a disintegrating effect on some pavements,



FLUSHING AND SPRINKLING NOZZLE.

while dust conditions make some forms of water cleaning apparently essential. Sprinkling is found, unless properly done, to have a tendency to form mud, which also tends to be destructive, especially on bituminous or tar-filled pavements. It is also obvious that by nature of pavement and by traffic and dirt conditions different streets require different cleaning methods. In Cleveland, for instance, of which city Gus H. Hanna is superintendent of street cleaning, it has been found that the most effective results have been obtained by using flushing machines working under a pressure of from 40 to 60 pounds, nozzles which can be regulated and with the water striking at a proper angle.

The Lake City flushing and sprinkling nozzle is the result of the experiments and experiences of Cleveland in street cleaning. The members of the firm of the makers, the Lake City Manufacturing and Supply Company, 1232 East Third street, Cleveland, O., were all formerly in the employ of the street cleaning department of the city for long terms. During these years improvements on the flushing machine were designed and tried out. It was found that in most cases too much water was used and also that side streets normally require less water than thoroughfares. The nozzle was therefore designed so that the amount of water used can be regulated. This regulation is not done from the driver's seat, but by turning the nut at the end of the nozzle, which serves to enlarge or reduce the nozzle outlet.

The nozzle can be changed into a sprinkling nozzle by regulating the

valve to its sprinkling opening by means of the nut and adjusting the nozzle to an angle of 90 degrees to the pavement. When used as a sprinkler a 35 to 40 foot stream can be thrown.

The nozzle is already in rather wide use and is particularly adaptable in the conversion of old machines—making it desirable for municipalities who do not wish to go to the expense of new ones. The nozzles have been found efficient on many types of machines and have been adopted as standard by a number of makers. In Cleveland they are in use on the street car flushers and on almost all the flushing machines. According to Superintendent Hanna's report the cost of flushing in his city for last year was only 13 to 15 cents per great square.

The accompanying illustration shows the Lake City nozzle.

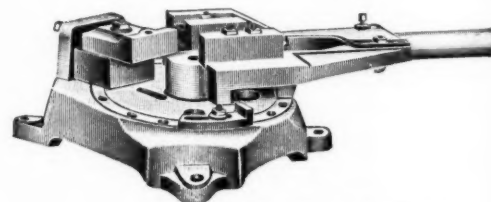
BAR BENDERS.

For Concrete Reinforcing Work and Other Contractor's Services.

The Hinman bar bending machines are made in four sizes, thus giving the contractor and builder, to whose work they are specially adapted, a wide range of capacities. They are built to bend reinforcing rods, bars or shapes of steel stock, hot or cold, and may be fitted with dies for hook, loop, U and angle bends.

The No. 4 bar bender is the one for use on the heaviest kind of work. It is particularly designed for bending reinforcing rods, flats, etc., to practically any desired angle, and its construction permits of hook, loop and U bends that are not usually possible with machines designed primarily for angle bending. A complete set of dies for angle bending, either 2, 3 or 5 inches high is furnished. A piece of shafting or cast block of the same diameter as the inside measurement of the hook or U desired will suffice for the other kinds of bends. The bender is fitted with gauges which eliminate laying-off stock and make easy the production of duplicate parts from heavy material. This size bender will handle $\frac{1}{2}$ x 2, $\frac{1}{2}$ x 3 and $\frac{1}{2}$ x 4 cold flats and 1 x 2, 1 x 3 and 1 x 5 hot flats, according to whether the 2, 3 or 5 inch die is used. For round, square or twisted work it will handle $1\frac{1}{4}$ inch cold stock and 2 inch hot. Hooks, loops and U bends, up to 12 inches across, outside measurement, can be bent cold with stock as large as $1\frac{1}{4}$ inches.

The No. 2 bar bender is constructed on the same general lines and is adapted to the same classes of work as the No. 4, but is a smaller, lighter machine and not designed for handling cold stock larger than $\frac{3}{4}$ inch round, square and twisted, or hot stock larger than $1\frac{1}{2}$ inches. The machine is furnished with a complete set of dies for angle bending, either 2 or 3 inches high. It is also fitted with gauges for duplicating work. The 2-inch die will handle flats $\frac{3}{8}$ x 2 cold and $\frac{3}{4}$ x 2 hot, and the



BAR BENDING MACHINE.

3 inch die can work up to $\frac{3}{8}$ x 3 cold and $\frac{3}{4}$ x 3 hot. Hooks, loops and U's up to $8\frac{1}{2}$ inches across can be formed on this machine.

The bar bender No. 3 is especially designed for bending reinforcing rods for concrete construction. It is meant for angle bending only and is not adapted to other work. It is fitted with 2, 3 and 5-inch dies having capacities of $\frac{1}{2}$ x 2, $\frac{1}{2}$ x 3 and $\frac{1}{2}$ x 4 cold flats, and 1 x 2, 1 x 3 and 1 x 5 hot flats respectively. Round, square and twisted work $1\frac{1}{4}$ cold and $1\frac{3}{4}$ hot are the capacities for all sizes.

The No. 1 post base bar bender is designed for handling only small stock, not larger than $\frac{1}{2}$ inch cold. It is durably constructed, convenient of operation and quickly set by bolting the socket to post or bench—or it can be set in a vise. It is recommended for angle bending only, but can be fitted with special dies for other shapes, if necessary. This little machine, which weighs only 60 pounds, can bend $1\frac{1}{4}$ x $1\frac{1}{2}$ cold flat, $\frac{1}{2}$ x 2 hot flat, $\frac{1}{2}$ cold round or square, and $\frac{7}{8}$ hot.

These benders, No. 4 of which is illustrated in the accompanying cut, are made by D. A. Hinman & Company, Sandwich, Ill.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—The leading interest has taken 400 tons of pipe for Blue Island, Ill. Municipal inquiries coming up for bids include only four or five jobs of from 150 to 200 tons. Recent specifications have been bringing a good tonnage to the foundries and routine orders are above the average. Quotations: 4-inch, \$33.50 to

\$34; 6-inch and larger, \$30.50 to \$31; Class A, \$1 extra. Birmingham—Conditions have been rather uneventful but prices are firm at advances. Wiley Alford and A. M. Shook, Jr., of Birmingham, and A. H. Campbell of Gadsden, have organized the National Pipe & Foundry Company and will build a soil pipe plant at Gadsden to be operated by hydro-electric power furnished by the Alabama Power Company. Quotations: 4-inch, \$29; 6-inch and up, \$26; 16-foot lengths, \$1 extra. San Francisco—No orders of importance have been in sight, but small ones, both private and municipal, aggregate a satisfactory tonnage. Los Angeles has ordered 200 tons of 20-inch, and Pasadena has taken a few cars of 4 to 6 inch. Quotations: 6-inch and over, \$36; 4-inch, \$39; Class A, \$1 extra. New York—The Warren Foundry & Machine Co. has been awarded the Lowell contract for 511 tons, the Queens (New York City) contract for 500 tons, and the Newburgh letting for 100 tons. R. D. Wood & Co. secured the Manhattan and the Bronx (New York City) contract for 315 tons. New Bedford, Mass., is expected to be in the market soon for pipe to be used in sewer extension work, and Olean, N. Y., is buying 120 tons. While municipal lettings are few, activity prevails in the buying of pipe by private companies. Quotations: 6-inch, Class B and heavier, \$30.50 per net ton; Class A, \$31.50.

Lead.—Lead has been dull, but its tone has changed from easy to steady. Quotations: New York, 7.50 cents, St. Louis, 7.375 cents.

The Worthington Pump & Machinery Corporation, recently organized under the laws of Virginia, has been declared the successor in ownership of the properties of the defunct International Steam Pump Company, the plan of the joint reorganization committee having become effective. The new company has acquired direct ownership of the properties owned by the International and its subsidiaries, with the exception of Henry R. Worthington, of which it owns practically all of the common and more than 95 per cent. of the preferred. It will start business with \$3,993,000 cash. All of the company's stock has been placed under a voting trust, to continue for five years from April 1, 1916. The voting trustees are Lewis L. Clarke, George G. Henry, Percy Jackson, R. Walter Leigh and Charles H. Sabin.

Decision on Iron Pipe Freight.—The Interstate Commerce Commission has rendered a decision holding that provisions in tariffs for the non-acceptance for transportation of less than 10,000 lbs. of iron pipe exceeding 10 ft. in length are unreasonable. The defendant carrier, the Ohio Electric Railway Company, for a number of years accepted iron pipe for transportation over its line without restriction as to size or quantity, but on Oct. 16, 1912, its

tariffs were amended to provide a higher rate for the transportation of lengths exceeding 6 ft. On March 18, 1913, the following provision was made, which is still in effect: "Pipe, iron, less than carload, exceeding 10 ft. in length: In lots of less than 10,000 lbs. not accepted; 10,000 lbs. or more in one consignment, when loaded by shipper and unloaded by consignee, official classification basis." In reporting upon the complaint of the Knapp Supply Company, Union City, Ind., against this provision the commission says: "Defendant is a common carrier engaged in interstate commerce and is bound under the express provisions of the act to accede to every proper application for service, subject only to such reasonable regulations as it may prescribe. It must accept less desirable traffic as well as that which is more desirable, and, although its best interest might be promoted by refusing to perform the service here in controversy, it has no right to refuse to transport iron pipe or any other article not dangerous to handle and which is ordinarily accepted for transportation."

The Thomas Auto Truck Company, Inc., has been incorporated to manufacture Thomas auto trucks of $\frac{3}{4}$, 1, 1½ and 2 tons capacity and also taxicabs. C. K. Thomas, identified with the motor truck industry for over 13 years, and for three years prior to 1916 vice-president and general manager of the Federal Motor Truck Company, New York, is president and founder of the company. Cloyd Marshall, formerly with the C. W. Hunt Company, is secretary and treasurer. The directors include William S. Thomas, formerly identified with J. M. Guffey & Co., Pittsburgh; O. S. Platt, Platt Pattern & Machine Works, Bridgeport, Conn.; Philip F. Donohue, who is identified with the advertising business, and George E. Whitney, automobile engineer, Bridgeport, Conn., and formerly chief engineer of the Locomobile Company of America. M. D. Herron, formerly sales manager of the Federal Motor Truck Company, is sales manager of the new company, and Walter Jones is chief engineer and superintendent. The factory and offices are located at 639-641 West 51st street, New York City. The trucks and taxicabs are constructed of standard units furnished by companies specializing in different parts.

The Goodyear Tire & Rubber Co., Akron, Ohio, is to issue \$10,000,000 of new preferred stock, the sale of which has already been underwritten. President F. A. Seiberling of the Goodyear company states that the financial extension is due to "the natural result of Goodyear growth, and the growth of the automobile industry." The company has been making factory enlargements for some time past, but even then, it is said, has not kept pace with business growth. It expects to practically double its production facilities within the next ten months. For a long time, in the automobile tire department, it has been turning out practi-

cally capacity—17,000 tires a day. Within a year the company hopes to have a capacity of 25,000 tires a day.

The Wyckoff Pipe & Creosoting Company, Inc., with its main office at 130 East 42nd street, New York City, announces that E. A. Mitchell, president, has bought a large coal mine in Alabama on the Black Warrior river. The coal is found to be of good quality and is approved by A. E. Mitchell, an expert engineer on coal values, to be one of the best for coke-making. The company may also build coke ovens and a chemical plant for manufacturing creosote oil and other by-products.

The American Cast Iron Pipe Company, Birmingham, Ala., and the **United States Cast Iron Pipe & Foundry Company**, Philadelphia, Pa., have each received from the Ulen Contracting Company, Chicago, Ill., an order for 2,500 tons of 4 to 30 in. pipe. The pipe is to be delivered in Uruguay for use in the fulfillment of the \$5,000,000 contract which the American International Corporation has entered for the construction of waterworks systems in three Uruguayan cities. The total quantity of pipe required is understood to be between 10,000 and 15,000 tons.

NEWS OF THE SOCIETIES

(Continued from page 666.)

Capt. H. J. Reilly, of the Chicago Tribune editorial staff, will speak on "Preparedness for the Engineer" at the annual dinner. Other noted speakers, including Col. Henry A. Allen, consulting engineer for the city of Chicago, are also scheduled to make addresses at the dinner.

In view of the support given the organization in the first year of its existence (100 joining per month and the present roll numbering 750) a huge attendance at each session is anticipated.

Indiana Gas Association.

The eighth annual convention of the Indiana Gas Association was held at Indianapolis April 25 and 26. At the closing session the following officers were elected: G. M. Dolley, of Logansport, president; E. J. Burke, of Indianapolis, vice-president, and James W. Dunbar, of New Albany, secretary-treasurer. The new directors elected are: W. W. Goodrich of Winchester; J. W. Maxon, of Muncie; C. D. Shaul, of Terre Haute; B. K. Cash, of Wabash, and J. D. Forrest of Indianapolis.

The association decided to hold the next meeting in Indianapolis next April.

The principal speaker at the closing session was E. J. Burke, commercial manager of the Citizens' Gas Company. He took as his subject, "Advertising and Publicity." Among other things Mr. Burke favored newspaper advertising, and the value of advertising matter included in gas bills sent out each month. Other papers presented included: Chester P. Wilson, of Indianapolis, "Financing Public Utilities Un-

der State Control," and "Service Rate and Rate of Return"; Charles A. Monroe, of Chicago, vice president of the public service commission of Northern Illinois, "How Can Gas Companies Secure More Wholesale Business?" Vernon Baker, of St. Louis, chief engineer of the Russell Engineering Company, "A Comparison of Modern Coal Carbonization Plants"; V. V. Smith, of Indianapolis, gave an address on the "Classification and Analysis of Gas Accounts."

Massachusetts Health Officers.

More than a hundred Massachusetts health officers, members of the Massachusetts Association of Board of Health, met at Boston April 27 for the quarterly meeting of the association. One of the subjects taken up for discussion and action was the formulation of standard health rules, in the hope that certain problems of health may be treated the same way in all the Massachusetts cities and towns.

There were addresses on "Home Rule in Public Health," by Dr. Francis George Curtis of Newton; "Legislative Measures of the Present General Court of Interest to Public Health Workers," by Dr. George L. Tobey of Clinton.

Illuminating Engineering Society.

The Illuminating Engineering Society, Pittsburgh section, gave a dinner April 22 at the Fort Pitt Hotel, at which several prominent engineers discussed "Interior Lighting." E. R. Roberts spoke on "Department Store Lighting;" W. L. Collins, on "Residence Lighting;" W. P. Hurley, on "Factory Lighting," and S. G. Hibben, on "Office Building Lighting." Prof. Charles F. Scott of Yale University, and a consulting engineer of the Westinghouse interests, talked on "Interior Lighting Generally."

Louisiana State Medical Society.

At the annual convention of the association held at New Orleans April 26 the following officers were elected: President, Dr. W. H. Seaman, bacteriologist of the New Orleans city and state boards of health; first vice president, Dr. T. S. Jones, Baton Rouge; second vice president, Dr. C. V. Unsworth, New Orleans; third vice president, Dr. T. M. Bodenheimer, Shreveport; secretary-treasurer, Dr. L. R. DeBuys, New Orleans; councilor of first congressional district, Dr. W. H. Knolle, New Orleans; councilor, second congressional district, Dr. Homer Dupuy, New Orleans; councilor, third congressional district, Dr. B. W. Smith, Franklin; councilor, fourth congressional district, Dr. J. E. Knighton, Shreveport; councilor, fifth congressional district, Dr. C. P. Gray, Monroe; councilor, sixth congressional district, Dr. J. J. Robert, Baton Rouge; councilor, seventh congressional district, Dr. E. M. Ellis, Crowley; councilor, eighth congressional district, Dr. E. Lee Henry, Lecompte; committee on scientific work, Dr. L. R. DeBuys; chair-

man, Dr. Paul Gelpi, New Orleans, and Dr. E. W. Mahler, New Orleans; committee on public policy and legislation, Dr. J. B. Vaughan, Collinston; Dr. M. W. Swords, New Orleans; Dr. Geo. S. Bel, New Orleans; Dr. W. H. Seaman, ex-officio; Dr. L. R. DeBuys, ex-officio; publication committee, Dr. L. R. DeBuys, New Orleans, chairman; Dr. W. J. Durel, Dr. J. B. Vaughan, Collinston; committee on budget and finance, Dr. Homer Dupuy, Dr. W. H. Knolle, Dr. E. L. Ieckert, Dr. C. V. Unsworth, Dr. B. A. Ledbetter; committee on memorial, Dr. J. M. Bodenheimer, Dr. Leon J. Menville, Dr. J. T. Nix, New Orleans; Dr. J. E. Knighton, Shreveport; Dr. F. R. Gomila.

PERSONALS

(Continued from page 666.)

E. Barnes, A. E. Cheesboro, J. T. Smith and W. M. Reed.

Wylie—E. R. Daniel, mayor; W. F. Duncan, attorney; J. A. Long, H. W. Lawrence and Albert Brown, aldermen.

Brady—Mayor, J. P. Sheridan; marshal, Louis Baker; aldermen, N. T. Cooke and L. A. Williams; attorney, E. P. Lee.

Princeton—B. D. Fagala, mayor; J. W. Chappell and G. D. Johnson, aldermen.

Stamford—F. E. Morrow, H. G. Young and G. W. McElveen, aldermen; W. B. Johnston, city assessor, collector and treasurer.

Whitney—E. Rice, mayor; J. N. Collier, W. S. Ford, A. D. Rhea, G. C. Finley and P. J. Sherman, aldermen; J. A. Low, marshal.

Dodd City—Mayor, J. F. Lee; aldermen, S. D. McGee, J. T. Hodge, W. H. Gray, Charles Love, Tom Van Nay; marshal, W. T. Hulsey.

Normangee—Henry Dillishaw was elected mayor; Bailey Anderson, marshal; aldermen, T. W. Brown, H. E. Shaw and S. J. Needham.

Frisco—E. D. Bacous, mayor; C. A. Boyd, city marshal; E. K. Warren, W. R. Wilson, M. E. O'Neil, W. J. Wagoner, B. R. Smith, aldermen.

Lott—O. R. Porterfield, mayor; J. W. Steen, city secretary; H. A. Patton, J. I. Rouse, A. C. Hinke, H. W. Stuart and J. C. Sarrazin, aldermen.

Rio Vista—Dr. H. L. Jones, mayor; C. Q. Walling, city marshal; G. T. Bishop, G. W. Cooper, J. M. Meason, N. Sandusky, C. H. Coffman, aldermen.

Stephenville—Charles Neblett, mayor; Richard Fagan, city marshal, and John Cage, Luther Burleson, C. N. Carlton and C. O. Blakeney, aldermen.

Holland—Earl Cockrum, mayor; N. C. Harmon, marshal; H. F. Wood, Logan Mewhinney, W. P. Bailey, M. M. Buckley and S. H. Barton, Jr., aldermen.

Following mayors have been elected in Nebraska:

Ainsworth—Cass Moore.

Albion—S. K. Pittinger.

Alma—J. G. Thompson.
Ashland—E. C. Wiggernhorn.
Arapahoe—Charles Peterson.
Auburn—W. P. Freeman.
Aurora—Dr. J. M. Woodard.
Benson—Fred A. Bailey.
Blair—Magnus Johnson.
Broken Bow—A. R. Humphrey.
Chadron—Allen G. Fisher.
Cozard—William McLaughlin.
Crawford—C. A. Minick.
Crete—John Tully.
David City—Arthur Myatt.
Falls City—W. S. Leyda.
Florence—F. S. Tucker.
Franklin—A. A. Galt.
Friend—C. E. Bowlby.
Fullerton—John Weens.
Gibbon—C. L. Wallace.
Gothenburg—T. L. Carroll.
Holdrege—William Nelson.

State of New York—The Civil Service Commission.

Open competitive examinations for the state service will be held in various cities throughout the state June 3, 1916, for the positions mentioned below.

99. **Assistant Chemist.** Public Service Commission, First District. \$1,201 to \$1,500. Candidates must be graduate chemists with at least two years' practical experience. The examination will presuppose a familiarity with analyses of steel and cast iron; cement; asphalt; coal tar pitches; mixed paints; dry pigments, etc.; water analyses; use of the microscope and general chemistry. Subjects of examination and relative weights: Written examination, 1; education and experience, 1. Open to non-residents. No sample questions.

115. **Electrical Engineer (Assistant).** Public Service Commission, First District. \$1,801 to \$2,400. Appointees to this position will have to handle a considerable amount of work in connection with theoretical computations on the design of electric railroad equipment, and should be thoroughly conversant with and experienced in the design, selection, installation and inspection of electric railroad motors, signals, switching apparatus, etc. Applicants must have had at least six years' recent experience in construction or operation of power stations and heavy traction systems. Graduation in engineering from a school of the highest grade will be accepted as equivalent to four years' experience. Subjects of examination and relative weights: Written examination, 2; experience, training and personal qualifications, 3. In rating the last-mentioned subject an oral examination may be held. Open to non-residents.

116. **Inspector of Steam Boilers.** State Industrial Commission. \$1,200. The duties of the position are to inspect and test boilers in various parts of the State. Subjects of examination and relative weights: Practical questions on the methods of testing and the construction of boilers, and the duties of the position, 6; experience, education and special training, 4.

118. **Junior Assistant.** Engineering Departments. \$901 to \$1,200. Men only. Minimum age 20 years. Subjects of examination and relative weights: Problems in applied mechanics and mathematics, including surveying, elementary structure and hydraulics; questions on surveying and construction practice, and on materials of construction, 3; experience, education and personal qualifications, 2. Open to non-residents. Original appointments are usually made at the minimum salary with opportunity for subsequent increase.

Application blanks will not be sent out by mail after May 22. Application blanks received at the office of the commission after May 24 will not be accepted. For blank address: State Civil Service Commission, Albany, N. Y.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Minn.	Morris	10 a.m., May 13	Building state roads	C. R. Wollthan, Co. Aud.
O.	Bowling Green	Noon, May 13	Paving and improving streets	J. E. Baird, Service Dir.
Mo.	Caledonia	noon, May 13	15,000 cu. yds. grading	W. R. Headler & Sons, Engrs., Potosi, Mo.
Wis.	Racine	May 13	Combined curb and gutter	City Engineer.
Cal.	Ventura	May 13	6.34 miles concrete pavement, 6 tons reinforcing steel and 17,720 cu. yds. excavation	J. B. McCloskey, Clk. Co. Supv.
Va.	South Boston	May 13	15,000 yds. pavement, estimated cost \$25,000	Anderson & Christie, Engineers, Charlotte, N. C.
Ky.	Williamsburg	May 13	Grading, draining and constructing culverts on 20 miles of road	E. F. White, Clerk. Co. Court.
O.	New Bremen	10 a.m., May 13	Concrete roadway and sidewalk on bridge	F. C. Keuthan, Co. Surveyor.
O.	Payne	noon, May 13	13,200 sq. yds. of pavement	C. B. Craig, Village Clerk.
La.	Bentley	noon, May 13	Constructing 96 miles of road	Road Commissioners.
La.	Sloux City	10 a.m., May 13	6-in. concrete paving	T. H. Johnson, Engineer.
Minn.	Jelle	3 p.m., May 15	Grading, draining and surfacing 6.25 miles	F. E. Magnusson, Town Clerk.
Ky.	Dayton	May 15	Concrete pavement, curb and gutter	W. C. Martin, City Clerk.
La.	Knoxville	7:30 p.m., May 15	Concrete sidewalks for one year	P. M. Black, City Clerk.
Ind.	Elwood	8 p.m., May 15	Constructing sidewalks	Eph. Rummel, City Clerk.
N. J.	Madison	8 p.m., May 15	2,750 sq. yds. macadam pavement	Boro Engineer.
Wis.	Sheboygan	4 p.m., May 15	8,660 sq. yds. concrete pavement and 5,510 ft. combined curb and gutter	John Kummer, Controller.
N. Y.	Albany	3 p.m., May 15	Paving and repaving with granite block, brick and asphaltic concrete	Bd. of Contract & Supply.
Ind.	Highland	May 15	Constructing concrete sidewalks	H. S. Daugherty, Town Clerk.
Minn.	Minneapolis	11 a.m., May 15	Grading and graveling 2,300 ft. of road	Al P. Erickson, Co. Auditor.
Minn.	Albert Lea	2 p.m., May 15	Grading and graveling roads	Fred Tavis, Co. Auditor.
Mo.	Stikeston	May 15	Laying 8,029 yds. asph. macadam with curb and gutter	B. L. Parker, City Engineer.
Mo.	Perryville	May 15	Grading 23 miles of road	Henry Heinbokel, Co. Clk.
Miss.	Canton	May 15	Improving several streets	W. L. Dickens, Mayor.
Mich.	Bay City	9 a.m., May 15	Constructing sidewalks during 1916	E. E. Prohaska, Secy. B. P. W.
Cal.	Venice	May 15	Asphaltic concrete pavement	C. Y. Burns, City Clerk.
Tex.	Beaumont	May 15	Constructing several roads	County Engineer.
Ind.	Vincennes	May 15	Paving with brick, cost \$65,000	Board of Public Works.
S. D.	Sioux Falls	May 15	Paving with stone blocks on sand base, cost \$23,000	S. B. Howe, City Engineer.
O.	Cincinnati	noon, May 15	Resetting curbs, resurf. with granite and const. drains	Chief Engineer, Dept. of Pub. Service.
Ky.	Louisville	2 p.m., May 15	Paving several alleys with brick	Roger McGrath, Sec. Bd. Pub. Works.
Minn.	St. Paul	10:30 a.m., May 15	Grading and graveling streets and furnishing 100,000 brick paving blocks	August Hohenstein, Pur. Ag't.
Cal.	Los Angeles	2 p.m., May 15	Improving road	H. J. Lelande, Co. Clerk.
Cal.	Lodi	May 15	80 to 100 cu. yds. asphalt paving plant	City Clerk.
Ind.	Fort Wayne	4 p.m., May 15	Constructing cement sidewalk	Bd. of Park Commissioners.
Pa.	Harrisburg	10 a.m., May 15	14 miles concrete, brick and bituminous road	State Highway Dept.
R. I.	Riverpoint	5 p.m., May 15	Macadamizing, curbing and guttering	Town Clerk.
Pa.	Lebanon	May 15	Paving streets, \$90,000 available	Paul Volcker, City Engr.
Ala.	Bay Minette	May 15	Grading and improving road, \$200,000 available	J. M. Garrett, Engr., Montgome-ry and Bay Minette.
N. D.	Mandan	1 p.m., May 15	Constructing concrete walks, steps and retaining wall at court house	Lee Nichols, Co. Auditor.
R. I.	West Warwick	5 p.m., May 15	Macadamizing and resurfacing three roads	Joseph Gendron, Town Clerk.
S. D.	Madison	May 15	17,000 sq. yds. of paving	C. A. Trimmer, City Engr.
Ind.	Plymouth	May 15	23 miles of road; cost, about \$127,000	A. W. Thompson, Co. Engineer.
O.	Cleveland	noon, May 15	Excavating and constructing drives at schools	F. G. Hogen, Dir. of Schools.
Cal.	Los Angeles	May 15	1.11 miles 5-in. concrete pavement	Bd. of Supervisors
Ky.	Lexington	May 15	Constructing county roads	R. W. Davis, Rd. Engr.
N. J.	Camden	8 p.m., May 15	Paving with Belgian block on concrete	City Engineer.
Ind.	Brazil	10:30 a.m., May 16	Constructing brick roads	W. O. Graesser, Co. Aud.
Ind.	South Bend	10 a.m., May 16	Paving streets	Veronica Sweeney, Clerk, Bd. P. W.
Minn.	Willmar	3 p.m., May 16	State road work	Samuel Nelson, Co. Aud.
Ill.	Morrison	10 a.m., May 16	26,803 sq. yds. brick paving	V. N. Taggart, Co. Hwy. Supt.
La.	Nevada	7:30 p.m., May 16	18,000 sq. yds. brick, concrete or asphaltic concrete and 7,000 ft. concrete curb	R. A. Davis, City Clerk.
Mo.	Kansas City	May 16	10,607 sq. yds. macadam pavement	A. C. Southern, Co. Surv.
N. Y.	New York	2 p.m., May 16	Repaving with sheet asphalt and granite and wood blocks on several streets	M. M. Marks, Boro. President.
N. Y.	New York	noon, May 16	Furnishing creosoted wood blocks	F. J. H. Kracke, Com. Bridges.
Md.	Upper Marlboro	May 16	1.12 miles state aid highway	H. Briscoe, Clk. Co. Comrs.
Texas	Corsicana	noon, May 16	Paving several sts. and constr. conc. curbs and gutters	J. A. Harper, City Sec'y.
Ill.	Sterling	10 a.m., May 16	6,803 sq. yds. brick pavement, 4,852 yds. excavation and 23,380 ft. concrete edging	J. S. Landis, Hghwy. Com'r.
N. Y.	Dunkirk	8 p.m., May 16	Paving and grading streets	A. D. Toomey, City Clerk.
Del.	Wilmington	noon, May 16	Improving 6,125 ft. of road	Jas. Wilson, Co. Engineer.
Ind.	Shelbyville	7:30 p.m., May 16	Improving and graveling alleys	Fiscal Court, Nicholas County
Ky.	Carlisle	May 17	Improving 6 miles of road	S. H. Burke, Boro Clerk.
N. J.	Woodlynne	8 p.m., May 17	Concrete curbing, macadam paving and brick gutters	T. J. Underwood, Controller.
Pa.	Washington	May 17	Constructing one mile of road	City Commission.
O.	Middletown	Noon, May 18	Paving with reinforced concrete	E. W. Sylvester, Supt. P. Wks.
N. Y.	Poughkeepsie	May 18	24,000 sq. yds. vitrified brick pavement, 4,700 lin. ft. blue-stone curb, etc.	D. J. Jones, Clerk, Pub. Serv.
O.	Youngstown	noon, May 18	Paving two streets	

BIDS ASKED FOR

STATE	CITY	RECD UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Pa.	Pittsburg	10 a.m., May 18	Reconstructing 22 miles of macadam with asphalt or brick; 29,000 tons ballast and screenings	J. D. Moore, Co. Controller.
Fla.	Miami	May 18	12,400 sq. yds. concrete sidewalks and 14,000 ft. curb	B. H. Klyce, City Engineer.
Ky.	Bellevue	8 p.m., May 18	Paving with brick	Jos. Hermann, Engineer, Crt House, Newport, Ky.
O.	Dayton	May 18	Graveling and oiling road (7,000 gals. of oil)	W. H. Aszling, Clk. Co. Comrs
N. Y.	Waterloo	May 18	23,000 yds. reinforced concrete pavement and 10,000 ft. concrete curb	M. L. Van Kirk, Vil. Engr.
Minn.	Bemidji	10:30 a.m., May 18	Clearing, grading and turnpiking on two state roads and seven county roads	J. L. George, Co. Auditor.
O.	Cincinnati	May 19	Improving several roads	W. H. Boen, County Engr.
O.	Columbus	May 19	92 miles of state road	Clinton Cowen, St. Hwy. Comm.
O.	Marion	May 19	35,000 sq. yds. paving, grading and curbing	Director Pub. Service
O.	Cheviot	noon, May 19	Oiling streets and alleys	A. J. Reusing, Village Clerk.
Mich.	Hudson	1 p.m., May 19	21,557 sq. yds. asphalt concrete or block resurfacing, cost \$23,143	F. B. George, Village Clerk.
O.	Cincinnati	noon, May 19	Cleaning and oiling county road	Albert A. Reinhardt, Clerk, Co. Commission.
Ga.	Atlanta	noon, May 19	Earth excavation and fill on road work	County Commissioners.
O.	Cable	2 p.m., May 20	Graveling roads (county furnishes gravel)	W. E. LaRue, Clerk, Township Trustees.
Ind.	Ft. Wayne	10 a.m., May 20	Road oils and bituminous binders for surface treatment of roads	Will Johnson, Co. Aud.
S. D.	Deadwood	10 a.m., May 20	7 road grading jobs, 40,000 cu. yds.	Fred Harris, Co. Auditor.
O.	Linden Heights	May 20	Paving with bituminous macadam, cost \$70,000	R. K. Schlaify, Engr., Colum bus, O.
Kan.	Lindsborg	May 20	21,000 ft. concrete curb and gutter	H. A. Rowland, Engineer, McPherson, Kan.
Wash.	Olympia	May 22	Surfacing with gravel or shale, 4 1/2 miles	Jas. Allen, State Hwy. Comm.
Md.	Cumberland	May 22	Paving and improving streets	R. L. Rizer, City Engr.
Pa.	Carbondale	May 22	50,000 sq. yds. brick pavement and 3,000 sq. yds. bituminous macadam	J. A. Saxe, City Engr.
Ind.	Kokomo	May 22	Oiling streets	Ben Havens, City Clerk.
Ind.	Indianapolis	10 a.m., May 22	Furnishing cement, gravel, sand, and reinforcing metal	L. K. Fesler, Co. Aud.
Md.	Baltimore	noon, May 23	2,000 cu. yds. of grad.; painting 28,000 ft. of guard rail	State Roads Commission.
Ind.	Warsaw	May 23	Paving three miles of streets	City Engineer.
O.	Loudonville	noon, May 23	Improving four streets	City Clerk.
Minn.	Luverne	10 a.m., May 23	Grading and surfacing state road	Olaf Skyberg, Co. Auditor.
Ind.	South Bend	10 a.m., May 23	Paving with gravel, curbing and constructing walks	Veronica Sweeney, Clerk, Bd. of Public Works.
Mich.	Belding	2 p.m., May 24	Paving streets	City Clerk.
Pa.	Reading	10 a.m., May 24	54,000 sq. yds. of paving and 8,000 sq. yds. of resurf.	E. G. Ulrich, City Engineer.
Kan.	Wichita	May 24	Paving two streets with brick	Bert Wells, City Engineer.
O.	Mansfield	May 24	Paving with brick and with tarvia	City Engineer
La.	Marshalltown	9 a.m., May 24	Paving on 16 streets with gravel and concrete	W. H. Hazeltine, City Engr.
O.	Tiffin	Noon, May 24	About 15,000 sq. yds. brick pavements	Wm. Heller, Dir. Pub. Serv.
Fla.	Sarasota	May 24	Change of date for road construction	C. A. Browne, Dist. Engr.
O.	Lima	May 25	Street paving, to cost \$500,000	A. L. Metheany.
Ind.	Bluffton	May 26	Paving streets, cost \$36,000	T. C. Guldin, City Engineer.
Wash.	Tacoma	11 a.m., May 26	Paving with brick, concrete, Warrenite or bitulithic for 6 miles	T. N. Morris, Co. Auditor.
W. Va.	West Union	May 26	Constructing several roads	Horner Bros., Engrs., Clarksburg, W. Va.
O.	Cincinnati	noon, May 26	Repairing county roads	Albert Reinhardt, Clerk, Co. Commissioners.
Ind.	Rushville	May 26	Oiling city streets	City Clerk.
La.	Houma	May 27	Constructing 12 miles of road, cost \$45,000	T. B. Smith, Engineer.
Ind.	Muncie	10 a.m., May 27	Constructing gravel and macadam roads	F. M. Williams, Co. Aud.
W. Va.	Lumberport	May 29	Paving streets, \$20,000 available	City Clerk.
Tex.	Coldspring	May 30	Constructing 24 miles sand-clay and gravel roads	L. S. Bryant, Engr., Shepherd, Tex.
O.	Columbus	noon, May 31	Drainage and macadamizing road	John Scott, Clerk, Co. Comr's.
D. C.	Washington	2 p.m., June 1	Repairing and resurfacing asph. pav't for two or five yrs. District Building	Chief Clerk, Engineer's Dept., District Building.
Ky.	Greenville	June 1	Six miles macadam and dirt road, \$20,000 available	J. N. Fentress, Co. Clerk.
O.	Crestline	June 1	Paving with brick, estimated cost \$9,000	J. W. Atkinson, Engineer, Galion, O.
Ill.	Decatur	June 1	Paving several streets with brick	P. T. Hicks, City Engr.
Mont.	Great Falls	June 1	Gravel bitulithic on four streets, cost \$45,000	W. H. Harrison, City Clerk
Ind.	Valparaiso	June 1	Constructing stone road	County Auditor.
Va.	Gates City	June 1	Improving roads, \$43,800 available	E. V. Martin, Engineer.
Ind.	Versailles	noon, June 1	Grading, paving and improving roads	J. T. Lochard, Co. Auditor.
Miss.	Hartford City	2 p.m., June 1	Constructing two roads	Co. Auditor.
Ind.	Columbus	June 1	20 miles of road; \$60,000 available	C. L. Wood, Engineer.
Ind.	Angola	1 p.m., June 1	Improving gravel road 3 miles long	F. C. Dewey, Co. Auditor.
Fla.	Palatka	June 10	Two miles of brick paving	County Comrs.
Kansas	Wichita	June 10	Paving several streets, cost \$25,000	B. C. Wells, City Engr.
Tex.	Caldwell	July 10	Sand clay roads; \$20,000 available	C. H. Maljowsky, Engineer.
La.	Estherville	June 11	Grading 21 miles of road	C. P. Smith, Co. Engineer.
O.	Greenfield	June 15	Brick and macadam pavement, to cost \$25,000	E. M. Conner, Village Clerk.
SEWERAGE.				
O.	Bowling Green	Noon, May 13	1,100 ft. sanitary sewers	J. E. Baird, Service Dir.
Texas	Austin	May 14	Sewering Little Shoal Creek, cost \$50,000	City Clerk.
S. D.	Mitchell	8 p.m., May 15	Constr. 3,545 ft. 8 and 10-in. vitrified pipe sewer	Thos. Eastcott, Co. Auditor.
Ind.	East Chicago	1:30 p.m., May 15	Constructing main sewer	T. Y. Richards, Clerk, Board Public Works.
Wis.	Milwaukee	May 15	Constructing portions of main intersecting sewer	J. H. Fowles, Sec'y. Sewage Commission.
N. J.	Spring Lake	May 15	Sewer in Pennsylvania avenue	J. H. Emlin, Engineer.
Ind.	Princeton	May 15	Constructing 8,500 ft. 6 and 8-in. tile	H. J. Toelle, City Engr.
Ariz.	Oatman	May 15	Sewer system with five miles 14-in. pipe	Mohave-Oatman Water Co.
Kansas	Neodesha	May 15	Intercepting sewer and disposal plant	J. J. Carroll, City Clerk.
O.	Columbus	noon, May 15	Furnishing 2,400 sewage sprinkling nozzles	G. A. Borden, Pres. Bd. of Pur.
Ont.	Dublin	2 p.m., May 15	Constructing drain	Jas. Jordan, Clk., Hibbert Twp. City Clerk.
La.	Lake View	May 15	Constructing sewers	City Clerk.
Mich.	Bay City	9 a.m., May 15	Furnishing materials and constructing sewers	E. E. Prohazka, Sec. B. P. W.
N. Y.	Albany	3 p.m., May 15	Constructing vitrified pipe sewers	Bd. of Contract & Supply.
Neb.	Alinsworth	May 15	Constructing sewers	T. Ritter, City Clerk.
Utah	Salt L. City	10 a.m., May 16	Sewer extensions	Gordon Snow, City Recorder.
Ind.	South Bend	10 a.m., May 16	Sewer and water connections in Michigan Street	Veronica Sweeney, Clerk Bd. Pub. Wks.
Conn.	Waterbury	8 p.m., May 16	Constructing sewers in several streets	R. A. Cairns, City Engr.
N. J.	Woodlynne	8 p.m., May 17	8-in. sewer extensions	S. H. Burke, Boro Clerk.
Wis.	Appleton	May 17	Constructing sewers in several streets	E. L. Williams, City Clerk.
N. Y.	New York	2 p.m., May 17	Altering and improving sewers	M. M. Marks, Boro. President.
Va.	Norfolk	1 p.m., May 17	Constructing sewers in 6 streets	W. H. Taylor, Jr., City Eng'r.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Pa.	Harrisburg	noon, May 17	Sewer in Bellevue road	W. H. Lynch, Supt. of Streets and Public Improvements.
Ill.	Chicago	noon, May 18	8,600 ft. intercepting sewer	John McGillen, Clerk, Sanitary District of Chicago.
Utah	Salt Lake City	May 18	60-inch storm sewer	S. Q. Cannon, City Engineer.
Ill.	Chicago	noon, May 18	8,600 ft. 16.5-ft. sewer	John McGillen, Cl'k, Sanitary District.
O.	Youngstown	noon, May 18	Constructing sewer	City Engineer.
N. J.	Newark	May 18	Constructing sewers	M. R. Sherrerd, Chief Engr.
la.	Northwood	May 19	Drainage ditch work; furnishing and laying 199,000 ft. 8 to 36-in. tile	C. N. Urdahl, Co. Auditor.
Wyo.	Greybull	8 p.m., May 19	Constructing main and lateral sanitary sewers, Imhoff tank, sprinkling and sludge beds	H. Higgins, Town Clerk.
Ind.	Frankfort	May 20	Constructing storm sewer	R. H. Boynton, City Engineer.
O.	Linden Heights	May 20	Sewer construction, cost \$18,000	R. K. Schladt, Engr., Columbus, O.
Alaska	Cordova	11 a.m., May 20	Sewer and water systems at Radio station	Bureau of Yards and Docks, Navy Department, Washington, D. C.
N. J.	Lyndhurst	May 20	Constructing sewers; cost \$20,000	Bowe & Wessells, Engineers, Rutherford.
Minn.	Spooner	May 22	Constructing sewer system and disposal works	A. M. Robertson, Vil. Clerk
Ind.	Kokomo	May 22	Constructing 12-in. tile sewer	Ben Havens, City Clerk
Mich.	Highland Park	May 22	Constructing sewers	R. M. Ford, Village Clerk
N. J.	Montclair	May 22	Constructing storm sewers	E. S. Clossen, City Engr.
N. J.	Ridgefield Park	May 23	Constructing sewers and disposal plant	Lederle & Provost, Engrs., 39 W. 38th St., N. Y. City
N. J.	Newark	2 p.m., May 23	Sec. 4 of outfall sew'ge works for Passaic valley sewer	Passaic Val. Sewerage Com'rs.
Ill.	Dixon	10 a.m., May 23	Sewage treatment plant at Epileptic Colony	W. F. Shields, Engr., Hartford Bldg., Chicago, Ill.
N. Y.	Binghamton	May 24	Constructing section 1 of main intercepting sewer	W. Earl Weller, City Engr.
Ohio	Tiffin	Noon, May 24	Constructing 1,762 ft. sewers	Wm. Heller, dir. Pub. Serv.
N. C.	Durham	2 p.m., May 25	10 1/2 miles 10 and 24-in. sewers	H. Keuffner, City Engineer.
Wis.	Milwaukee	May 25	Inverted syphon under river and 11,000 ft. 30 to 72-in. sewers	T. C. Hatton, Chief Engr., Sewerage Commission
Ill.	Rock Island	May 30	48-in. storm drain	William McConochie, Mayor.
N. J.	Newark	2 p.m., May 31	Section of 54 and 64-in. tunnel and open cut sewer	Passaic Val. Sew'ge Com.
Wis.	Monticello	7:30 p.m., June 1	Constructing sewers and disposal plant (Imhoff)	W. G. Krichoffer, Engineer, Madison, Wis.
Ill.	Marshall	June 1	Nine blocks combined sanitary and storm water sewers	J. W. Lewis, Chairman Bd. of Local Impts.
Arizona	Oatman	June 15	Water and sewer systems, estimated cost \$250,000	C. L. Mayhew, Sec. Mohave-Oatman Water Co.
O.	Xenia	June 15	Constructing storm sewers, cost \$35,000	J. P. Shumaker, City Engineer.
Minn.	Benson	July 1	48 miles drainage ditch; 250 miles 6 to 30-in. tile	F. B. Gardner, Engineer.
Ill.	Salem	July 15	Sewer system and disposal plant, cost \$50,000	City Clerk.
WATER SUPPLY				
N. Y.	Albany	3 p.m., May 13	Engine and other supplies for Water Bureau; extending water mains	Board of Contract & Supply.
Ill.	Maywood	8 p.m., May 15	Improving waterworks system	Supt. of Waterworks.
Ore.	Yoncalla	May 15	46,520 feet 6 to 10-in. wood or steel pipe, 2,680 ft. 2-in. pipe, rock filled dam and concrete lined reservoir	M. B. Germond, Engineer, Roseburg, Ore.
Mass.	Newton	May 15	Reinforced concrete reservoir	E. H. Rogers, City Engr.
N. Y.	Brooklyn	2 p.m., May 16	Hauling and laying water pipe in 14 streets	Com'r of Water Sup., Gas & El., Man., Municipal Bldg.
Neb.	Alliance	May 16	Waterworks improvements to cost \$10,000	Grant & Fulton, Engineers, Lincoln, Neb.
Ind.	South Bend	10 a.m., May 16	Water and sewer connections	Veronica Sweeney, Clerk Bd. of Pub. Wks.
Wis.	Denmark	May 16	6 and 8-in. pipe, hydrants and specials, valves, etc., elevated tanks	Geo. Rathke, City Clerk
Minn.	Westbrook	8 p.m., May 16	40,000-gal. steel tank on 30-ft. tower	Joseph Budish, Recorder.
la.	Fort Madison	3 p.m., May 17	Constructing 1,000,000-gal. concrete reservoir	Burns & McDonnell, Eng'rs., Interstate Bldg., Kan. City, Mo.
O.	Ironton	May 18	Concrete distributing reservoir, force main, pumping house and filtration plant	W. L. Watson, Resident Engr.
O.	Coshocton	noon, May 18	3,000,000-gal. vertical triple expansion pumping engine	Sam Ashman, Service-Safety Director.
S. D.	Redfield	2 p.m., May 18	Power plant building and equipment and underground steam main	C. J. Mariner, City Auditor.
N. J.	Millville	3:30 p.m., May 19	Liquid chlorine for six months	W. F. Ware, Director of P'ks & Public Property.
Mo.	St. Louis	noon, May 19	26,900 ft. 36-in. lock bar steel, rivetted steel water pipe and laying the same	Water Commission, City Hall.
Alaska	Cordova	May 20	Water and sewer systems at Radio Station	Bureau of Yards and Docks, Navy Department, Washington, D. C.
Col.	Pueblo	May 20	Excavating 100,000 cu. yds., constructing earth dam and raising reservoir	A. A. Welland, Engineer, Thatcher Bldg.
O.	Wooster	noon, May 22	Laying 4,375 ft. 12 and 16-in. c. i. pipe and taking up 2,200 ft. 4 and 6-in.	Max Bloomberg, Dir. Pub. S.
Kan.	Wakeeney	May 22	Water works extension and pumps	J. H. Heckman, City Clerk
Colo.	Grand Junction	May 23	Constructing 3,950 ft. 60-inch wood stave pipe	U. S. Reclamation Service.
Wash.	Wenatchee	6 p.m., May 23	Making and laying 5,470 ft. 63-in. reinforced conc. pipe	W. P. Knapp, Sec. Drain. Dis.
O.	Columbus	noon, May 23	Installing steel lining for soda tank at water purification plant	Jerry O'Shaughnessy, Supt. of Waterworks.
Mont.	St. Ignatius	2 p.m., May 25	220,000 cu. yds. of excavation; making and laying 6,230 ft. concrete pipe	U. S. Reclamation Service.
Wash.	Aberdeen	May 31	Constructing water system, cost \$400,000	L. D. Kelsey, City Engr.
W. Va.	Madison	June 1	Constructing water works system	H. W. D. Mullens, Mayor.
Tex.	El Paso	June 3	Electrically operated pumping equipment	Depot Quartermaster, Ft. Bliss
Wash.	Everett	June 5	28 miles of flow line, 2 river crossings, rock-fill dam and other improvements; estimated cost \$600,000	Burns & McDonnell, Eng'rs., Interstate Bldg., Kan. City, Mo.
Arizona	Oatman	June 15	Installing water and sewer systems, cost \$250,000	C. L. Mayhew, Sec. Mohave-Oatman Water Company.
MISCELLANEOUS				
Pa.	Williamsport	May 13	10-ton road roller	G. K. Harris, Supt. Sts. & Pub. Improvements.
Alberta	Medicine Hat	May 15	Constructing dam and ditch	F. Kennedy & Sons.
D. C.	Washington	2 p.m., May 15	Repairing and rebuilding water tower for fire dept.	Pur. Officer, District Bldg.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
D. C., Washington	May 15	Constructing postoffice at Newport, R. I.	Supervising Architect.	
D. C., Washington	2 p.m., May 15	Steel and cast iron sluice and regulator gates and frames.	U. S. Reclamation Serv.	
N. J., Elizabeth	May 15	Constructing and equipping playground.	Bd. of Recreation Com's'n's.	
Ky., Waterbury	8 p.m., May 16	Driving tunnel.	R. A. Cairns, City Engineer.	
Wash., Seattle	May 16	Hydraulic fill of 130,000 cu. yds.	County Commissioners.	
O., Youngstown	noon, May 17	One automobile	Director of Pub. Service	
N. J., Camden	8 p.m., May 18	Furnishing three runabouts for fire department.	H. B. Read, Chair., Fire Com.	
Ind., Indianapolis	10 a.m., May 18	Two automobiles	L. K. Fesler, Co. Auditor.	
Minn., Fergus Falls	9 a.m., May 19	Ditching work, estimated cost \$7,000.	Wm. Lincoln, Co. Auditor.	
Tex., Angleton	May 19	Constructing drainage ditches, bridges, street drains and clearing streams.	T. A. Munson, Engr.	
D. C., Washington	2 p.m., May 19	Furnishing automobile tires and tubes.	Pur. Officer, District Bldg.	
Minn., Bemidji	2 p.m., May 19	Drainage ditch; cost, \$406,770.	J. R. Jordan, Co. Aud.	
N. M., Silver City	1.30 p.m., May 20	Furnishing rock crusher.	E. B. Venable, Co. Clk.	
Fla., Tallahassee	10 a.m., May 20	Constructing and improving canals.	F. C. Elliott, Chief Drainage Engr.	
D. C., Washington	May 20	Two ship-building cranes at Mare Island Navy Yard.	Bureau of Yards and Docks, Navy Dept.	
Ill., Maple Park	2 p.m., May 20	200,000 cu. yds. of excavation on drainage work.	Hay & Lowman, Engineers, Sycamore, Ill.	
O., Cincinnati	May 22	4,200 bbls. portland cement.	U. S. Engineer Office.	
Wis., Racine	2 p.m., May 22	Several miles of drainage ditches.	P. J. Hurtgen, Engineer, Burlington, Wis.	
Ore., Portland	2 p.m., May 22	Two-wheel tractor	J. R. Wood, City Pur. Agent.	
Wyo., Ft. Laramie	May 22	Constructing two tunnels and lining canal with concrete.	U. S. Reclamation Service.	
N. J., New Brunswick	3 p.m., May 22	One 6-ton auto truck	Edward Burt, Co. Collector.	
Ind., Muncie	11 a.m., May 22	Constructing drainage ditch	Wm. Ritchie, Supt. of Con.	
N. Y., Albany	May 23	Constructing sub-structure, super-structure and approaches to bridge for two bridges over Hudson and Mohawk Rivers	W. W. Wotherspoon, State Supt. Pub. Wks.	
Wash., Wenatchie	May 23	5,470 ft. 53-in. reinforced concrete pipe and 100 tons 1/2-in. 2-piece steel bands with shoes and nuts for 60-in. water-tave pipe	W. T. Knapp, Secy. Wenatchie Reclamation District City Engineer.	
Cal., Sacramento	m., May 23	Constructing weir, cost \$460,000.	U. S. Reclamation Service.	
Wyo., Fort Laramie	May 25	8 1/2 miles canal, requiring 793,000 cu. yds. excavation.	Public Service Commission.	
N. Y., New York	May 25	Subway construction.	U. S. Reclamation Serv., Federal Bldg.	
Col., Denver	10 a.m., May 25	115,000 bbls. Portland cement	City Clerk.	
N. J., Elizabeth	May 25	Collecting and removing ashes and garb. for three yrs.	I. A. Patterson, Co. Auditor.	
la., Bloomfield	noon, May 29	Drainage ditch, estimated cost \$41,490.	County Clerk.	
Neb., Fremont	May 31	Constructing drainage ditch	Bureau of Yards and Docks, Navy Dept.	
D. C., Washington	June 3	One-ton bucket dredge.	W. C. Wolf, City Engineer.	
Ill., Belleville	June 15	Improving creek, cost \$79,600.		

STREETS AND ROADS

Gadsden, Ala.—Oiling of Fourth St. has been ordered by Council. Plans also were made for purchase of more street machinery.

Mobile, Ala.—Survey for 90 miles of improved roads in Baldwin County has just been completed, according to C. L. Strange, assistant engineer.

Texarkana, Ark.—Bids for bonds which were authorized at recent meeting will be opened May 18th, according to word received from Morris E. Sanderson, attorney for Board of Commissioners. Amount necessary for construction of road and bridge over Red River is in neighborhood of \$430,000, and for the purpose it is proposed to issue 15-year, 5 per cent. bonds.

Los Angeles, Cal.—Council has passed ordinances changing grade on several streets.

Los Angeles, Cal.—Council will order improvement of Middlebury St. grading, curbing and constructing sidewalks.

Placerville, Cal.—City trustees ordered resolution drawn calling a \$30,000 bond election for paving of State Highway route through that city. Placerville school trustees also decided to call \$35,000 bond election for erection of two new school buildings.

Pomona, Cal.—Road commissioner has been instructed to prepare plans and specifications for work on Brea Canyon Rd.

San Francisco, Cal.—Board of Works has initiated proceedings for paving of San Bruno Ave., between Steuben St. and Cortlandt Ave., cost estimated at \$22,375. It directed that plans be prepared for improving Union St., between Stockton and Kearny, and Mason St., between Francisco and Bay.

Bridgeport, Conn.—City will pave nine streets with water bound macadam.

Mystic, Conn.—Plans being discussed for widening Main St.

Pueblo, Colo.—City asphalt plant is being repaired to be in readiness for extensive repairs in surfacing city streets which will start about May 15.

Dover, Del.—See "Water Supply."

Newark, Del.—Council has instructed street committee to get bids for street sweeper.

Wilmington, Del.—County engineer has been instructed to advertise for bids for constructing 1 1/4 miles of road.

Bartow, Fla.—Election has been called for June 1 to determine whether Polk County shall issue bonds for \$1,500,000 for construction of about 220 miles and sand-asphalt roads.

Gainesville, Fla.—\$21,000 in 5 per cent University Ave. bonds have been purchased by Atlantic National Bank or Jacksonville, whose bid was \$21,235.03, accrued interest from Jan. 1, 1916, to be added.

Atlanta, Ga.—W. J. Douglas, of firm of Barclay, Parsons & Clapp, New York, will prepare plans for proposed plaza over railroads.

Peyton, Ga.—See "Bridges."

Thomasville, Ga.—Jefferson County, Florida, contemplates bond issue of \$50,000 for roads.

Banner, Ill.—Plans being discussed for improving road from this town to Canton.

Lincoln, Ill.—Logan County Board of Supervisors has taken necessary legal steps to procure 10 miles of gravel roads for county.

Quincy, Ill.—Overhead ornamental street signs on all corners have been recommended.

Quincy, Ill.—Improvement of six streets by paving has been recommended.

Fort Wayne, Ind.—Plans ordered for walks on both sides of Anthony Blvd., from Pontiac St. to Rudisill Blvd.

Hartford City, Ind.—Plans are being made for paving Cherry St. and Campbell Rd. Materials used will probably be brick and water bound macadam.

Hartford City, Ind.—Bids will be received June 5 for paving road in Harrison township at estimated cost of \$8,950.40, and road in Washington township, at cost of \$4,102.

Indianapolis, Ind.—Resolutions confirmed by board provide for permanent improvement of several streets and alleys.

Indianapolis, Ind.—Board of public works asked Council for appropriation of \$5,000 to the street repair, permanently improved, except asphalt fund. Money would be used to buy wooden blocks to repair streets.

Kokomo, Ind.—County Commissioners will call for bids shortly on paving C. M. Ricketts road with macadam and the Dan Brown road with asphaltic concrete.

Muncie, Ind.—Special committee of city council has adopted resolutions approving construction or resurfacing of several streets and for other minor improvements. Day of hearing on these improvements has been set for May 20.

Portland, Ind.—Improvement of West High St. with brick has been ordered by City Council.

Richmond, Ind.—Five petitions have been approved for improvement of three miles each of National road with concrete at estimated cost of \$180,000. Contract will probably be let before the middle of July.

Versailles, Ind.—All bids for street work have been rejected. City will re-advertise for bids returnable June 5. J. Francis Lochar is Auditor, Ripley Co.

Winchester, Ind.—Commissioners have appointed viewers for nine roads.

Marshalltown, Ia.—Council has passed resolutions proposing to pave districts Nos. 3, 4, 5 and 6, being Summit St., North and South Center St. and North Third Ave. to city limits. Cost of North Third Ave. paving estimated at \$12,100; North Center St. at \$12,595.65; South Center St. at \$117,984.90; Summit St. at \$12,952.65. W. S. Steiner is city engr.

Carlisle, Ky.—Nicholas County has about \$75,000 available for good road work this year under state aid besides about \$12,000 which will be expended in repair work on wide roads of county.

Covington, Ky.—Kenton County Commissioners and the Advisory Board held meeting May 2 to discuss improvement of pikes and roadways with \$150,000 bond issue. Advisory Board submitted its conclusions to Commissioners as follows: Spend on Lexington pike \$60,000; Madison pike, \$60,000; Decoursey pike, \$15,000; Taylor Mill pike, \$15,000; total \$150,000, which would consume entire bond issue. Decision was postponed.

Frankfort, Ky.—Commissioner of Roads Terrell has said that there would be \$4,000,000 spent in Kentucky this year on construction and reconstruction of roads under supervision of his department.

Georgetown, Ky.—Contracts have been awarded for work on several turnpikes.

Lagrange, Ky.—Oldham County's \$35,000 road bonds were signed and delivered May 1 to Illinois Trust Co., of Chicago. A corps of engineers is now at work surveying in county, and just as

rapidly as estimates can be made bids will be asked for.

Lexington, Ky.—Road Commissioners expect soon to advertise for contracts for about \$20,000 worth of work.

Maysville, Ky.—County Judge Rice has called election for issue of \$200,000 in bonds money to be used for purpose of rebuilding turnpikes in Mason County, for June 24.

Owenton, Ky.—The Owen county fiscal court made an order advertising for bids to build 32 miles of turnpike under state supervision. Twenty thousand dollars of fund is being raised by popular subscription.

Paducah, Ky.—City commissioners reconsidering action of recent meeting in passing resolution for construction of sidewalks.

Houma, La.—Special road committee will advertise for bids for construction of whole, or different sections, of hard surface road to be constructed between Houma and Thibodaux. Road will be built according to plans and specifications submitted by Engineer T. B. Smith.

Shreveport, La.—At election in De Soto Parish property owners of Mansfield and vicinity authorized a \$250,000 bond issue for building hard surfaced roads. Of bond issue \$150,000 is for constructing link in Jefferson Highway and \$100,000 is for gravel roads out of town of Mansfield.

Beverly, Mass.—Orders adopted for installation of curbing on several streets.

Holyoke, Mass.—Board is in the market for scrapper for steam roller. T. J. MacCarthy, C. E., is Clerk.

Lowell, Mass.—See "Water Supply."

Lowell, Mass.—Plans are being discussed for relocation of First St. and for making thoroughfare a State highway. Cost is estimated at \$80,000.

Northampton, Mass.—List of streets and amounts to be expended on each under proposed \$30,000 appropriation are as follows: Wright Ave., \$720; Wright Ave. bridge, \$526; Pleasant St., \$1,860; Bridge St., \$3,445; North St., \$1,625; Market St., \$1,703; King St., \$2,350; South St. from the bridge, \$863; South St. from Olive St., \$4,700; King St., \$2,200; Beacon St., Florence, \$2,500; North Main St., Florence, \$5,557.

Adrian, Mich.—Madison township voted in favor of bond issue for \$75,000 for good roads at special election May 1. Roads to be constructed will eventually connect Adrian with stone roads of Ohio.

Lansing, Mich.—If Supreme Court upholds constitutionality of new automobile tax law Secretary of State Vaughan will have \$425,000 which will be divided among various counties of state according to number of machines credited to them on state books. Money can be used only for construction and maintenance of highways.

Duluth, Minn.—Property owners will meet shortly and select one of the following materials for pavement on Twenty-first Ave. east: Asphalt, non-skid and concrete.

Duluth, Minn.—Preliminary steps for opening of highway to Duluth approach of steel plant bridge, recently approved by War Department, have been taken by city commissioners. Resolution ordering vacation of private property for highway leading from McCuen St. to Minnesota Steel Co.'s property has been adopted and city attorney instructed to institute proceedings for condemnation and acquisition of property.

Minneapolis, Minn.—County Commissioners have authorized bids for concrete road through Robbinsdale, which it is estimated will cost \$25,000.

St. Paul, Minn.—\$155,000 has been set aside for road improvement in Ramsey County. More than 15 miles of highway have been scheduled for grading and treatment of gravel and clay. J. H. Armstrong is County Engineer.

Greenwood, Miss.—Leflore County has voted in favor of \$600,000 bond issue for highway improvement. It is expected that first road to be built will be continuation of Humphreys Highway to Tallahatchie County line on north, and to Holmes County line on the south.

Hattiesburg, Miss.—Forrest County Board of Supervisors have ordered that work of constructing highway from Covington County line on the north to Harrison County line on south, a distance of 40 miles parallel with Gulf & Ship Island Railroad, be begun at once and rushed to completion.

Joplin, Mo.—City commission will decide shortly on plan to use concrete or asphalt macadam in paying approaches

to North Main Street viaduct at estimated cost of \$2,400.

Joplin, Mo.—Petition has been filed asking for paving of Main St. with National Paving.

Kansas City, Mo.—Ordinances have been passed authorizing paving to be done on several streets.

Kansas City, Mo.—Southwest Boulevard from terminal subway at 25th St. to Main St. has been ordered paved with brick by board of public works.

Kansas City, Mo.—City contemplates big paving program. Curtis Hill, city engineer, will include 8-inch base in specifications for all new paving in downtown district.

Liberty, Mo.—Executive committee of Clay County Road Improvement Association has decided to ask county court to submit within next sixty days proposal to build a system of 199 miles of roads in county. Cost was estimated by government engineer and W. B. Cauthorn of Columbia to be 1 1/4 million dollars.

Piedmont, Mo.—Wayne County has voted in favor of \$200,000 bond issue for roads and bridges.

Butte, Mont.—City Engineer Armstrong has been authorized to purchase 200 pieces of iron pipe from Anaconda Copper Mining Co. for purpose of installing street signs at various corners.

Omaha, Neb.—City engineer will be asked to prepare plans and estimates of cost of paving thirty-five miles of boulevards now open to travel, three and one-half miles under way and five miles contemplated in southwest part of the city. City Planning board, municipal affairs committee of Commercial club and improvement clubs, will be asked to consider this proposition. Commissioner Hummel of Park and Boulevard System recommends bond issue of from \$1,000,000 to \$1,500,000 to carry out project.

Omaha, Neb.—Ames Ave., 36th St. to west city limits, has been declared paving district by City Council. Indications are that this improvement will be completed this season.

Bayonne, N. J.—Petitions have been received asking for street asphalt paving on Cooper St. and Agnes St. Ordinances have been passed for improvements of 12 new streets and property owners on these streets have all been notified to make their gas, sewer and water connections before improvements are started.

Boonton, N. J.—Council passed on final reading ordinance calling for widening of Washington St. at canal bridge by condemning of 1,100 ft. of Cookerow property. Ordinances for curbing of North Main St. and grading, curbing and paving of West Main St. have been received on first reading.

Branchville, N. J.—Franklin township committee voted to construct road 500 ft. long from Branchville-Layton macadam road to shore of Culver's Lake.

Elizabeth, N. J.—Council has adopted resolutions ordering repairs of sidewalks, curbs and gutters on several streets.

Elizabeth, N. J.—Ordinance has been passed establishing grade on Front St. from Livingston St. to the Elizabeth River.

Elizabeth, N. J.—Resolutions have been adopted, directing Street Commissioner Neafsey to publish notice of intention to grade Vine St. from Chilton St. to De Hart place, and to flag east side of Bayway from Rahway to Jersey Aves. Street commissioner also was authorized to construct two sewer basins in Broad St.

Metuchen, N. J.—Council has passed ordinance for construction of concrete sidewalks on several streets.

Metuchen, N. J.—The Pennsylvania Railroad Co. asked council for permit granting them right to open Grove St. and Main St. to place conduits in these streets. Permit was granted by mayor.

Morristown, N. J.—Street committee of Board of Aldermen received bids May 1 for paving Evergreen Ave., from railroad to Evergreen Cemetery, with a strip of amesite with shoulders of macadam 6 ft. wide on either side: Spring St. in same manner, from Center St. to Morris St., and around two sides of James Park in Park Pl. with amesite Osborne & Marsellis Co. appeared to be low bidders for Evergreen Ave., and John B. Gougherty for work in Spring St. and around park. There were three bidders for each of sections, the third being Gray Construction Co.

New Brunswick, N. J.—Resolutions have been adopted for improvement of five turnpikes. A. Fox is County Engr,

Newark, N. J.—Plans are being made for repairing of main thoroughfares in Hillside township. Bids will be invited for laying sidewalks on Broadway, proposals being asked for both blue stone flagging and concrete walks.

Orange, N. J.—Ordinances have been passed providing for wood block pavement on Main St. and authorizing bond issue of \$80,000 to pay for improvement. Both measures will come up for second reading May 16.

Passaic, N. J.—Council has given notice of intention to order following improvements: Construction of grade, curb, gutter and flag in Cedar St., on both sides, between Belmont Ave. and Botany St.; grade, curb and flag Bogart Ave. on both sides, and to lay a permanent pavement thereon, its entire length; grade Morris Ave., its entire length. Frank V. Romaglia is Borough Clerk.

Perth Amboy, N. J.—Ordinance passed authorizing improvement of Rector St. by paving with vitrified brick, and curbing and guttering.

Perth Amboy, N. J.—Council considering plans for paving Lehigh Ave.

Vineland, N. J.—At recent meeting of Landis Township Committee delegation from East Vineland requested repairs to be done on Dante Ave. Committee will view road before taking any steps in the matter.

Albany, N. Y.—Ordinance has been passed appropriating \$48,000 for repairing of Central Ave.

Albany, N. Y.—Ordinance has been passed authorizing improvement of Morris St. for distance of 265 ft.

Albany, N. Y.—Mayor Stevens has approved ordinances authorizing construction of receiving basins, paving and curbing, and other work in connection with construction of the Southern Boulevard by state, and making an appropriation of \$2,500.

Albion, N. Y.—Citizens have voted \$120,200 for street improvements.

Binghamton, N. Y.—See "Sewerage."

Brooklyn, N. Y.—Board of estimate has authorized expenditure of \$500,000 for repaving public thoroughfares in Brooklyn and Queens. Of this amount \$300,000 will go to Brooklyn and \$200,000 to other borough.

Brooklyn, N. Y.—See "Sewerage."

Buffalo, N. Y.—Sealed proposals will be received by the Lighthouse Inspector, Buffalo, N. Y., for furnishing 525 barrels of American Portland cement, delivered at Lorain, Ohio. Further information may be obtained on application to above-named officer.

Buffalo, N. Y.—See "Sewerage."

Ellicottville, N. Y.—Taxpayers have approved proposition to pave Monroe St. and part of Main and Jefferson Sts.

La Salle, N. Y.—Bond issue of \$55,000 is contemplated to pay share of International Railway Co. for work of improving River Rd. Suit will afterwards be brought against company to recover amount expended. Proposed boulevard through village will be 30 ft. wide and of brick. Village's share of the improvement will amount to \$28,000.

Lockport, N. Y.—Appropriation bill awaiting governor's signature is for \$10,000 to be spent on highway improvements. It is expected that 7 miles of Youngstown-Ransomville road will be improved at cost of about \$12,000 a mile.

Newburgh, N. Y.—New Paltz-Plattekill state road is among number advertised to be repaired by contract this spring.

Norwood, N. Y.—Town will spend \$9,000 for road work to be done under direction of Commissioner King.

Oswego, N. Y.—Plans being prepared in Albany for Volney-Fulton Highway, one-half mile, and Sandy Creek-Boylston Highway, six miles.

Oswego, N. Y.—Highway department is making arrangements to call for bids on construction of proposed Parish-Amboy state road in towns of Parish and Amboy, a distance of five miles.

Rochester, N. Y.—Council will order improvement of several streets by paving.

Saratoga Springs, N. Y.—Common Council has approved plan of Commissioner of Public Works N. R. Thomson to expend \$27,500 on streets during the next eight months. This will include all work on streets excepting sprinkling. It is proposed by department to resurface many streets in city.

Spencerport, N. Y.—Village Board has decided to have cement curb constructed full length of Lyell Ave., inside village limits.

Charlotte, N. C.—Petitions have been

filed asking for paving and construction of sidewalks on several streets.

Columbus, O.—Contracts will be let May 19 for improvement of following roads: Athens county, Logan-Athens Rd., 1.5 mile; Auglaize county, Kenton Wapakoneta Rd., 1.0 mile; Auglaize county, Celina-Kossuth Rd., 1.1 mile; Columbiana county, Salem-Alliance Rd., 4.12 miles; Defiance county, Hicksville-Defiance Rd., 3.94 miles; Fulton county, Toledo-Auglaize Rd., 2.32 miles; Fulton county, Wauseon-Napoleon Rd., 1.53 mile; Geauga county, Cleveland-Meadville Rd., 5.64 miles; Guernsey county, McConnellsville-Cambridge Rd., 1.08 mile; Guernsey county, National Rd., 7.48 miles; Hancock county, Lima-Sandusky Rd., 6.48 miles; Hancock county, Lima Sandusky Rd., 3.48 miles; Lima-Sandusky Rd., 2.34 miles; Huron county, Barberton-Greenwich Rd., 1.26 mile; Huron county, Belleville-Norwalk Rd., 0.90 mile; Knox county, Columbus-Wooster Rd., 0.94 mile; Knox county, Columbus-Wooster Rd., 0.98 mile; Lake county, Painesville-Warren Rd., 0.71 mile; Licking county, Newark-Lancaster Rd., 2.12 miles; Logan county, Bellefontaine-Richwood Rd., 1.32 mile; Madison county, Washington-London Rd., 0.81 mile; Miami county, Piqua-Sidney Rd., 5.78 miles; Muskingum county, Zanesville-Dresden Rd., 1.47 mile; Richland county, Mansfield-Mt. Vernon Rd., 1.5 mile; Richland county, Belleville-Lexington Rd., 1.50 mile; Ross county, Cincinnati-Chillicothe Rd., 1.85 mile; Sandusky county, Fremont-Bowling Green, 6.01 miles; Summit county, Akron-Canton Rd., 2.06 miles; Trumbull county, Chagrin Falls-Greenville Rd., 3.09 mile; Union county, Marysville-Marion Rd., 0.34 mile; Washington county, Marietta-McConnellsville Rd., 1.09 mile; Wayne county, Wooster-Canal Dover Rd., 1.98 mile; Williams county, Bryan-West Unity and Bryan-Wauseon Rds., 4.69 miles; Williams county, Bryan-Edgerton Rd., 6.75 miles; Wyandot county, Forest-Upper Sandusky Rd., 1.02 mile.

New Albany, O.—Appropriation of additional \$5,000 for repairing streets is being considered.

New Albany, O.—Council contemplates expenditure of \$10,000 for repairing asphalt streets.

Oxford, O.—Petition is being circulated for paving on Spring Street.

Springfield, O.—Estimates will be prepared by engineering department in accordance with instructions from city commission on cost of paving South Fountain Ave. from Perrin to John St. and Kenton St. from York to East.

Urbana, O.—Plans being considered for road around "sink hole" near West Liberty. Road which now passes over the hole will be closed.

Urbana, O.—All bids for street sprinkling have been rejected. Work will be re-advertised, bids to be opened May 15.

Youngstown, O.—City will receive bids May 24 for following bond issues: \$5,500 Ridge Ave. wall bonds, \$7,790 Lincoln Park Drive paving bonds, \$315 Oak Hill Ave. sewer bonds, \$5,290 South Ave. sewer bonds, \$5,540 Warren Ave. and Garlick St. sewer bonds, \$7,480 Parkview et al streets sidewalks bonds. J. R. Edwards is City Auditor.

Coburg, Ore.—County road between Coburg bridge over McKenzie river and town of Coburg will be improved at once. It will be scarified and then rolled.

Roseburg, Ore.—County court has ordered 500 cu. yds. of gravel for 3,000 ft. of road north of Comstock.

Ardmore, Pa.—Residents and business men of Ardmore and other towns along Lancaster pike have petitioned turnpike company to oil road.

Chester, Pa.—Ordinance adopted on first reading providing for opening and grading of Worrall St. from 24th St. to Elkington St.

Conyngham, Pa.—Town will pave main street for half mile with amlesite.

Eric, Pa.—B. E. Briggs, city engineer, has been instructed by council to report on requests of board of education for establishment of grades on 31st and Perry Sts., near site of proposed Lincoln high school.

Hazleton, Pa.—Construction of concrete road from this town to Harleigh is contemplated.

Kittanning, Pa.—Ordinance has been passed authorizing paving of section of Jefferson alley.

Lemoine, Pa.—Council contemplates paving Bosler Ave.

Marcus Hook, Pa.—Borough Council has passed finally ordinance providing

for improvement of the principal streets of town.

Middletown, Pa.—Council will discuss question of paving streets and bridge construction.

Philadelphia, Pa.—Work will be started shortly by state highway department on Wynnwood Rd., at Narberth.

Pittsburgh, Pa.—Ordinance for \$114,000 bond issue for repaving of Butler St., from Thirty-eighth St. to Sharpsburg Bridge, referred to Finance Committee.

Pottsville, Pa.—Council will purchase new stone crusher.

Titusville, Pa.—It has been decided to build brick road, 16 ft. in width, from end of the macadam highway on Hydetown road, through village of Hydetown to Fleming crossing just west of village.

Central Falls, R. I.—Petition to construct granolithic sidewalk, 112 ft. in Dexter St. referred to aldermanic committee on highways and bridges.

Providence, R. I.—South Kensington taxpayers will hold annual financial town meeting on May 16th and at that time, it is said, steps may be taken towards establishment of more efficient highway system.

Woonsocket, R. I.—Contracts for repairing Hamlet Ave. from Front St. to railroad crossing; Blackstone St. from Arnold St. to Harris Ave., and Allen St., have been awarded by board of aldermen. Aggregate cost of macadamizing these streets will be \$35,505.50.

Sumter, S. C.—Tentative plans have been made for paving with brick, asphalt and concrete. Funds from bond issue, \$225,000 will, at approximate cost of paving which has been let, pave about seven and one-half miles of city streets.

Bristol, Tenn.—Hawkins county reported to have ample money available at once for important construction work, and first road to be built is that extending from Wood, at river bridge south of Old Kingsport, to Rogersville, and thence to Red Bridge Ferry. This stretch of road is about thirty miles in length.

Bristol, Tenn.—State Engineer Nelson has recommended use of coal pitch for allaying dust on streets.

Nashville, Tenn.—Tennessee State Highway Department is asking for bids on bituminous material in anticipation of treating about 100 miles of water bound macadam and chert gravel roads in five counties. Specifications have been prepared by State Highway Department in connection with Engineering Departments of Vanderbilt University and University of Tennessee. A. M. Nelson is State Highway Engineer.

Cooper, Tex.—Voters have defeated bond issue of \$200,000 for good roads.

Corpus Christi, Tex.—Bond issue of \$150,000 for bluff improvement and paving is contemplated. Majority of property owners seem to favor proposition.

Corpus Christi, Tex.—Aransas Pass voted to issue bonds to amount of \$10,000 to build its portion of diamond loop highway to Padre Island, distance of 14 miles. This makes a total of \$260,000 voted to construct links of proposed highway connecting San Antonio, Corpus Christi, Laredo and Brownsville.

Brigham City, Utah.—Plans are being discussed for rebuilding road between Brigham and Beaver Dam.

Ogden, Utah.—City engineer has been directed to prepare plans and specifications for paving 26th St. between Washington and Madison Aves., and Orchard Ave. between 25th and 26th Sts. with a view of asking for bids.

Salt Lake City, Utah.—Count commission decided to refuse bids for widening and straightening road in Big Cottonwood Canyon and instructed George W. Holmberg, county road supervisor, to have work done by road department.

Norfolk, Va.—Commission rejected all bids received for surfacing Ocean View boulevard from Lafayette bridge. An alternate proposition of F. J. McGuire, which embraces plan of improving road at 25 cents per sq. yd. was accepted, and he will do work according to specifications prepared by engineer, from Lafayette bridge to gate at fair grounds.

Portsmouth, Va.—Appropriation of between \$5,000 and \$6,000 has been requested for construction of sidewalks in Port Norfolk.

Charleston, W. Va.—Elections called for May 31 in Loudon and Big Sandy districts of Kanawha County for bond elections so that road improvements costing \$360,000, can be made.

Spokane, Wash.—Plans prepared by county engineer calling for asphaltic macadam surface for Madison-Valleyford permanent highway have been dis-

approved by state highway commission. Plans for Apple way, Mead Road, and Spring Valley Road all were approved, with asphaltic macadam or asphaltic concrete surfaces. Roads approved were ordered advertised for bids, but Valleyford section will be held up until explanation is received from highway commissioner.

Sheboygan, Wis.—Condemnation proceedings were ordered entered into for extension of Center Ave. from North Fourth St. to lake. Land in question consists of approximately 46,000 square feet.

BIDS RECEIVED AND CONTRACTS AWARDS.

(*Indicates contract awarded.)

Denver, Colo.—Gaff & Keefe Construction Co., Denver, for laying five miles of concrete surface at approximately \$14,000 per mile.

Pueblo, Colo.—M. Skiff for laying about 1,200 cu. yds. of macadam on Northern Ave. at \$1.20 per cu. yd.

Dover, Del.—Barrett Co., New York, for resurfacing State and Lockerman Sts. at \$1,500.

Augusta, Ga.—For motor apparatus for street department as follows: *W. C. Moran, agent for White Motor Co., for one motor sprinkler at \$4,225 and one 2-ton motor dumping truck at \$3,700; *Holley Wagon Works, agent for Springfield-Kelly Manufacturing Co., for one 3-ton motor dumping truck at \$3,490, and one 2-ton motor dumping truck at \$2,937.50.

Moscow, Ida.—Standard Asphalt Paving Co., Spokane, Wash., for paving, at \$34,553. In addition to paving, concern will build storm sewer, sidewalks and curbs, for which will be paid extra.

Alton, Ill.—For paving Main St. as follows: R. K. Stafford, \$81,388.53; Henry Grabbe, \$81,885.48; C. H. Degenhardt, \$82,448.74; Dunlap Dippold, of Edwardsville, \$85,296.57; C. M. Hanes of Jerseyville, \$86,246.73; Hoeftken Bros. of Belleville, \$92,826.72; Myer Construction Co. of St. Louis, \$96,720.24; John Cherry of Jacksonville, \$84,319.32; Sells Kohler of Pana, \$89,423.76; Curdie Construction Co., \$88,453.38; H. R. Wolf, \$89,419.89; Rees Bros. of Quincy, \$91,102.98; J. B. Miller, \$85,998.54. Engineer's estimate, \$106,031.02.

Franklin, Ind.—John Murphy, Greenwood, at \$9,500, for gravel road in Johnson County. John C. Gregg is County Auditor.

Franklin, Ind.—For gravel road in Johnson County: John Murphy, Greenwood, Ind., at \$6,960; John Myers, Acton, Ind., at \$19,408. John C. Gregg is County Auditor.

Greensburg, Ind.—For 1½ miles of macadam road as follows: Moor & Crise, Letts Corner, at \$7,495; Thompson & Davis at \$7,845; Chas. Reddington at \$7,587. J. C. Barbe is Co. Auditor.

Indianapolis, Ind.—United Paving and Construction Company for paving 34th and 38th Sts., between Sutherland Ave. and Center-Warren, township line. Paving is to be asphalt. 34th St. work at \$91,000, is 2.71 miles long, and 38th St. work at \$64,000, is 2.42 miles long. High bids on work were \$23,000 larger than low bids.

Indianapolis, Ind.—For paving with "first grade" asphalt bids on a lineal foot basis were: 42d St. from College Ave. to Monon railroad, Republic Construction Co., \$2.87; Indiana Asphalt Paving Co., \$2.86, and American Construction Co., \$2.97. Julian Ave., from Audubon Rd. to Arlington Ave., Union Asphalt Construction Co., \$1.50 for a 12-ft. roadway, and Indiana Asphalt Paving Co., \$1.37 for a 12-ft. roadway. Winthrop Ave., from 34th St. to Fairfield Ave., with "first grade" asphalt on the lineal foot basis: Republic Construction Co., \$2.96; Indiana Asphalt Paving Co., \$2.85, and the American Construction Co., \$2.86.

Jasper, Ind.—For 37,001 sq. ft. concrete sidewalk, 3.795 ft. concrete curb: *Aug. F. Gehlhauser, 214 Bray Ave., Evansville, Ind., at 11 cents per sq. ft. for sidewalks and 38 and 40 cents for curbs, total bid, \$6,444.89.

Jeffersonville, Ind.—For grading, paving and improving road: *Martin F. O'Neil, local, at \$3,329.00. G. W. Stoner is Co. Auditor.

Kokomo, Ind.—For road work as follows: Hercules road: *Charles Stahl, for \$3,180; Locke road: *F. H. Null, Windfall, for \$4,789; *Kokomo Asphalt Paving Co., for Matlock road, extension to West Jefferson St. pike, for \$11,650.

Muncie, Ind.—By Delaware county

commissioners for construction of macadam road from Hoyt Ave., in Muncie, to Burlington road: *Thomas E. Prutzman for \$54,960. For brick roadway on Selma road: *William Birch for \$30,300. *T. E. Prutzman for macadam road on Neely Ave., for \$8,972. *Joseph E. Davis to construct Frank E. Hlatt gravel road in Monroe township for \$9,300.

New Castle, Ind.—For 11,000 sq. yds. brick pavement, cement foundation, *Boone Const. Co., Lebanon, Ind., at \$1.79 per sq. yd.

Newcastle, Ind.—For improvements of three city streets: *Boone Construction Co., for brick pavement of 18th St., at \$41,028.34. For A Ave. asphalt pavement, *M. H. Oxley, at \$10,293.80; *James Garveny, for brick pavement of Central Ave., at \$1,737.50.

Portland, Ind.—For paving two roads with brick as follows: Keeg Rd.: *Adam Bros., of Lebanon, at \$38,000, Brazil block to be used; Page Rd., *Fitzmaurice & Beard at \$7,599, using Medal block.

Paoli, Ind.—For constructing gravel and macadam roads: *Worley Galloway, French Lick, Ind., and *Lankford & Lankford, Paoli, Ind. E. A. Palmer is Co. Auditor.

Barbourville, Ky.—*T. J. Vermillion & Son, local, for six miles of Cumberland River highway extension and *Sam Jackson of Flat Lick for three miles toward Bell County line.

Greenville, Ky.—For construction of 6½ miles of streets: *Cresap Bros., of Humboldt, Tenn., for \$24,632.16.

Louisville, Ky.—For vitrified brick improvement of Oak St. from State to East 7th, as follows: Brick Asphalt & Paving Co., Medora brick \$4.70 a foot, Pebbles \$4.70, Albion \$4.65, with a rebate on curb 25 cents and rebate on walk 11 cents; Staebler & Griggs, Carlisle brick, \$4.15, Bloomdale \$4.13, rebate on curb 27 cents and rebate on walk 10 cents; Goulding Bros., Albion brick \$4.24, rebate on curb 20 cents, rebate on walk 11 cents. For macadam improvement of Center St.—Staebler & Griggs, \$2.93 a foot and Goulding Bros., \$2.94. For repair of asphalt surface on Spring St. Jefferson County Construction Co., \$1.10 to \$1.50 a sq. yd.; Bickel Asphalt and Paving Co., \$1.12 to \$1.27, and Goulding Bros., \$1 a sq. yd.

Louisville, Ky.—*Southern Asphaltoline Road Co., for oiling streets at bid of \$37,100.

Paducah, Ky.—*Harold & Harting, for constructing 2 miles of road at \$4,521.99.

Russellville, Ky.—*Rhea G. Price, of Auburn, for completion of the Franklin and Morgantown road for \$12,000.

Springfield, Mass.—*Adams & Ruxton, local, for paving on Main St., at estimated cost of \$8,000.

Bay City, Mich.—*J. A. Campbell, local, for paving one-half mile of country road, 16 ft. wide, with concrete, at \$5,202. C. L. Fox is County Clerk.

Bozette City, Mich.—*Maresman & Greene, Grand Rapids, Mich., for 12,000 sq. yds. concrete pavement at \$1.37 per sq. yd., 36 cts. per cu. yd. for excavation.

Duluth, Minn.—*Rodgers & McLean for paving First St. with brick and sandstone curbing at approximately \$66,000.

Minneapolis, Minn.—Low bids received for road work as follows: T. M. Kite, at \$3,900, for 3,600 ft. of graded and graveled road from Shady Lake to Hopkins; H. F. Balch, for work from Long Lake to Wayzata, at \$14,000, and Joseph Mergens, at bid of \$6,765 on 54th St., from Lyndale to Portland Ave. S.

Aubury Park, N. J.—For paving first section of Keyport-South Amboy road with amiesite: R. G. Shreffler of Long Branch was lowest bidder, his price being \$17,329. Other bids were: F. H. Riddle, New Brunswick, \$19,445; C. H. Winans Co., Elizabeth, \$19,707; Liddle & Pfeiffer of Perth Amboy, \$19,020; Joseph F. Burke, Plainfield, \$18,248. Section of road to be improved contains about 10,700 sq. yds.

Elizabeth, N. J.—For road oil to be delivered during the season in tank cars lots on sidings in Elizabeth, as follows: Standard Oil Co., 7.71 cts. a gallon; Pennsylvania & Delaware Oil Co., 6½ and 7.21 cts.; Sands-Klein Co., 8.2 cts.; Logan & Hathaway, 7.21 cts.

Hoboken, N. J.—*W. T. S. Crichtfield for paving with asphalt at \$121,106.

Hoboken, N. J.—*Charles T. Cavanagh, Inc., Bayonne, N. J., for paving with Belgian block at \$49,595.

Morristown, N. J.—For resurfacing Evergreen Ave., Osborne & Marsellis were lowest bidders, asking \$1.55 per yd. for amiesite on trap rock base, \$1.54 for amiesite on native stone base, and

60 cents for water bound macadam wing. J. G. Gouherly was lowest bidder on Spring St. road, asking \$1.54 for amiesite on trap rock base, \$1.50 for amiesite on native stone base, and 59 cents for water bound macadam wing. Same contractor made lowest bid for Park Pl. road, giving figure of \$1.54 for amiesite on a trap rock base, and \$1.50 for same material with a native stone base.

Newton, N. J.—Lowest bids for grading and widening 6.65 miles of road were as follows: Franklin Contracting Co., New York, at \$30,113.70; Reilly & Knapp Construction Co., Pottsville, Pa., \$31,773, and Joseph F. Burke, Plainfield, \$32,837.90. Contract calls for widening of road to 30 feet and entails removal of 51,190 cu. yds. of earth and 5,500 cu. yds. of rock.

Paterson, N. J.—For third section of Paterson-Hamburg Turnpike, *Union Building & Construction Co., for \$94,032.52.

Perth Amboy, N. J.—For paving Rector St.: O. W. Ramsay—Excavation, 80 cts. cu. yd.; concrete, \$6; new curb, 80 cts.; Mayer vitrified brick, \$2.25; Shawmut brick, \$2.25. Meagher & Smith—Excavation, 85 cts.; concrete, \$6.25; new curb, 86 cts.; Shawmut brick, \$2.22; Mayer brick, \$2.23. Graham & McKeon—Excavation, 90 cts.; concrete, \$6.50; new curb, 85 cts.; Mayer brick, \$2.24. Liddle & Pfeiffer—Excavation, 87 cts. cu. yd.; concrete, \$6.40; new curb, 85 cts.; Mayer brick, \$2.30.

Albany, N. Y.—*Michael F. Dollard for improvement of three streets for \$23,266.25.

Albany, N. Y.—For repair of highways by State aid as follows: Schenectady County, 5.31 miles—Brown & Lowe Co., Schenectady, \$27,749.10; Thomas Murray, Le Roy, \$29,976; Joseph Walker Construction Co., Albany, \$30,205.60; John B. Dower, Ballston Spa, \$31,090; Flood & Van Wirt Co., Hudson Falls, \$31,399; Rumpf & Stevens, Lake Placid, \$31,439; John P. Dugan & Co., Inc., Amsterdam, \$31,760; Richard Hopkins, Troy, \$33,262; Sewerage Disposal & Water Plant Co., Schenectady, \$37,305. Saratoga County, 22.50 miles—Richard Hopkins, Troy, \$6,777; Defiance Corporation, Ticonderoga, \$6,966.75; Flood & Van Wirt Co., Hudson Falls, \$7,424.05; County Construction Co., Troy, \$7,491.50; Joseph Walker Construction Co., Albany, \$7,504.25. Warren County, 29.08 miles—Defiance Corporation, Ticonderoga, \$5,972.56; Gleason & Davitt, Albany, \$5,998.06; Joseph Walker Construction Co., Albany, \$6,027.56; Kellogg-Boynton, Keeseville, \$6,078.06; Flood & Van Wirt Co., Hudson Falls, \$6,606.56.

Albany, N. Y.—Lowest bidders for repair of public highways by State aid were as follows: Repair Con. 862, Albany County, 19.93 miles: John T. O'Neil, Troy, N. Y., \$7,080.75; Langan Const. Corp., Albany, N. Y., \$7,530.60; H. A. Murphy, Albany, N. Y., \$7,695.25. Repair Con. 910, Albany County, 4.16 miles: Jos. Walker Const. Co., Albany, N. Y., \$11,781.48; Gleason & Davitt, Albany, N. Y., \$12,092.42; S. B. Van Wagenen, Inc., Rondout, N. Y., \$12,790.52. Repair Con. 914, Cayuga and Oswego Counties, 46.04 miles: W. F. Hill & Co., Fulton, N. Y., \$17,991.70; J. H. Weidman, Syracuse, N. Y., \$18,124.15; Edwin Styring, Syracuse, N. Y., \$18,341.95. Repair Con. 895, Columbia County, 10.13 miles: Jos. Walker Const. Co., Albany, N. Y., \$3,568.96; Conway Bros. & Kennedy, Eddyville, N. Y., \$3,613.96; County Const. Co., Troy, N. Y., \$3,878.13. Repair Con. 923, Columbia County, 2.80 miles: Jos. Walker Const. Co., Albany, N. Y., \$10,501; Thos. J. Martin, Beacon, N. Y., \$11,025; County Const. Co., Troy, N. Y., \$11,494. Repair Con. 928, Cortland County, 41.86 miles: McGreevey, McGuigan & Baum Const. Co., Elmira, N. Y., \$12,630.98; F. H. Wells, Savannah, N. Y., \$12,694.08; Richard Hopkins, Troy, N. Y., \$13,102.75. Repair Con. 877, Erie County, 12.59 miles: Cold Springs Const. Co., Buffalo, N. Y., \$5,042.90. Repair Con. 907, Franklin County, 19.06 miles: Kellogg-Boynton, Keeseville, N. Y., \$5,387.60; Rock & Griffin Co., Watertown, N. Y., \$5,429.65; Richard Hopkins, Troy, N. Y., \$5,670.70. Repair Con. 904, Jefferson County, 2.47 miles: Rock & Griffin Co., Watertown, N. Y., \$12,746.57; W. T. Thayer, Chateaugay, N. Y., \$12,883.08; Rumpf & Stevens, Lake Placid, N. Y., \$12,944.25. Repair Con. 860, Jefferson County, 31.88 miles: Richard Hopkins, Troy, N. Y., \$10,596.02; Rock & Griffin Co., Watertown, N. Y., \$10,636.06; Kellogg-Boynton, Keeseville, N. Y., \$10,949.87. Repair Con. 854, Livingston County, 1.09 mile: John C. Bradley, Cornin, N. Y., \$11,395; F. S. Strong, Hornell,

N. Y., \$11,473.25; Kennedy Const. Co., Albany, N. Y., \$11,477. Repair Con. 874, Livingston and Wyoming Counties, 46.76 miles: Crouch Bros., Rochester, N. Y., \$13,956.22; Sweeney & Boland, Rochester, N. Y., \$13,961.87; Ribstein-Holter Co., Inc., Rochester, N. Y., \$14,227.65. Repair Con. 875, Monroe County, 43.63 miles: Crouch Bros., Rochester, N. Y., \$7,814.625; Chas. F. Gallagher & Bro., Rochester, N. Y., \$9,261.65; Whitmore-Rauber & Vicinius, Rochester, N. Y., \$9,468.26. Repair Con. 885, Oneida, Otsego and Herkimer Counties, 51.3 miles: James E. Martin, Utica, N. Y., \$17,218.12; Dale Engineering Co., Utica, N. Y., \$17,466.90; Nash & Griffin, Norwich, N. Y., \$17,861.40. Repair Con. 869, Rensselaer County, 0.29 mile: Gifford Const. Co., Jamaica, N. Y., \$4,798.32; Edward Walsh, Troy, N. Y., \$5,083.31; County Const. Co., Troy, N. Y., \$5,154.07. Repair Con. 900, Rensselaer County, 1.73 mile: Gleason & Davitt, Albany, N. Y., \$10,092.10; Langan Const. Corp., Albany, N. Y., \$10,244.10; Edward Walsh, Troy, N. Y., \$10,385.95. Repair Con. 871, Rensselaer County, 1.47 mile: Thos. H. Karr, Troy, N. Y., \$6,781.63; Gifford Const. Co., Jamaica, N. Y., \$7,699.44; Edward Walsh, Troy, N. Y., \$8,590.63. Repair Con. 913, Rensselaer County (withdrawn). Repair Con. 866, Saratoga County, 22.50 miles: Richard Hopkins, Troy, N. Y., \$6,777; Defiance Corp., Ticonderoga, N. Y., \$6,966.75; Flood & Van Wirt Co., Hudson Falls, N. Y., \$7,424.05. Repair Con. 917, Schenectady County, 5.31 miles: Brown & Lowe Co., Schenectady, N. Y., \$27,749.10; Thos. Murray, Le Roy, N. Y., \$29,976; Jos. Walker Const. Co., Albany, N. Y., \$30,205.60. Repair Con. 855, Schuylar County, 22.04 miles: McGreevey, McGuigan & Baum Const. Co., Elmira, N. Y., \$8,084.18; John W. Gurnett, Watkins, N. Y., \$8,492.02; James T. Moore, Watkins, N. Y., \$8,691.672. Repair Con. 881, Ulster County, 19.05 miles: Jos. Walker Const. Co., Albany, N. Y., \$12,671.98; Edw. Hartney, Modena, N. Y., \$15,651.30; J. F. Gallagher Co., Inc., Kingston, N. Y., \$19,054.56. Repair Con. 898, Warren County, 29.08 miles: Defiance Corporation, Ticonderoga, N. Y., \$5,972.56; Gleason & Davitt, Albany, N. Y., \$5,998.06; Jos. Walker Construction Co., Albany, N. Y., \$6,027.56. Repair Con. 867, Westchester County, 7.60 miles (no bids received). Repair Con. 879, Westchester County, 6.01 miles (no bids received). Repair Con. 919, Westchester County, 9.68 miles (no bids received). Repair Con. 857, Yates County, 24 miles: McGreevey, McGuigan & Baum Const. Co., Elmira, N. Y., \$8,716.22; Richard Hopkins, Troy, N. Y., \$9,415.30; Kennedy Const. Co., Albany, N. Y., \$9,880.60.

Albany, N. Y.—Low bids received by State Highway Commission, May 5, 1916, for repair of public highways by State Aid: Repair Con. 856, Allegany County, 15.42 miles: Kennedy Const. Co., Albany, N. Y., \$5,371.05; McGreevey, McGuigan & Baum, Elmira, N. Y., \$5,711.72. Repair Con. 890, Cattaraugus County, 8.37 miles: Shipman & Lincoln, Gowanda, N. Y., \$2,620.44. Repair Con. 891, Chenango County, 10.90 miles: H. A. Murphy, Albany, N. Y., \$4,130.75; Paddelford & King, Sherburne, N. Y., \$4,136.50; John H. Gordon, Albany, N. Y., \$4,220.75. Repair Con. 893, Delaware & Otsego Counties, 12.86 miles: H. A. Murphy, Albany, N. Y., \$5,671.75; Griffin & Griffin, Norwich, N. Y., \$5,756.75; Nash & Griffin, Norwich, N. Y., \$5,781.06. Repair Con. 905, Essex County, 25.85 miles: Langan Const. Co., Albany, N. Y., \$8,059.80; Defiance Corporation, Ticonderoga, N. Y., \$8,317.53; Kellogg-Boynton, Keeseville, N. Y., \$8,452.75. Repair Con. 883, Fulton County, 33.66 miles: John P. Dugan & Co., Inc., Amsterdam, N. Y., \$12,309.64; Brady-Oltarsh Cons. Co., New York City, \$15,158.30; Clarence Welsh & Co., Gloversville, N. Y., \$14,754.28. Repair Con. 922, Greene County, 15.50 miles: H. A. Murphy, Albany, N. Y., \$6,455.70; DeGraff & Hogeboom, Inc., Kingston, N. Y., \$6,858.81. Repair Con. 932, Jefferson & Lewis Counties, 9.32 miles: Pathfinder Cons. Co., Inc., Fulton, N. Y., \$4,896.20; Richard Hopkins, Troy, N. Y., \$4,992; Spellman-Oliver Co., Chateaugay, N. Y., \$5,181.15. Repair Con. 859, Lewis County, 17.23 miles: Pathfinder Cons. Co., Inc., Fulton, N. Y., \$5,482.90; Spellman-Oliver Co., Chateaugay, N. Y., \$5,697.90; Richard Hopkins, Troy, N. Y., \$5,795.05. Repair Con. 884, Madison County, 33.89 miles: Alfred H. Flinn, Albany, N. Y., \$10,859.70; John H. Weidman, Syracuse, N. Y., \$11,044.20; Dale Eng. Co., Utica, N. Y., \$11,097.40. Repair Con. 853, Monroe County, 1.76 mile: Henry G. White, Rochester, N. Y., \$10,987.50; Hendrickson & McCabe Cons. Co., Spencerport, N. Y.,

\$11,383.50; Dodge Cons. Co., Inc., Rochester, N. Y., \$11,662.40. Repair Con. 873, Monroe County, 30.65 miles; Ribstein-Holter Co., Inc., Rochester, N. Y., \$7,855.35; Dale Engineering Co., Utica, N. Y., \$8,122.47; Sweeney & Boland, Rochester, N. Y., \$8,126.16. Repair Con. 916, Onondaga County, 67.71 miles; Edwin Styring, Syracuse, N. Y., \$30,582.69; Rich and Hopkins, Troy, N. Y., \$31,675.20; Kennedy Cons. Co., Albany, N. Y., \$32,274.80. Repair Con. 878, Ontario County, 26.44 miles; Kennedy Cons. Co., Albany, N. Y., \$6,906.45. Repair Con. 927, Orange County, 3 miles; Schunnemunk Cons. Co., Highland Mills, N. Y., \$18,675.50; DeGraff & Hogeboom, Inc., Kingston, N. Y., \$18,864; Jackson Brothers, Cuddebackville, N. Y., \$19,173.50. Repair Con. 889, Orange County, 31.76 miles; Edward Hartney, Modena, N. Y., \$3,637.025; Schunnemunk Cons. Co., Highland Mills, N. Y., \$3,703.15; Gleason & Davitt, Albany, N. Y., \$3,704.88. Repair Con. 896, Orange County, 5.91 miles; Griffin & Griffin, Norwich, N. Y., \$2,099.525; Edward Hartney, Modena, N. Y., \$2,118.79. Repair Con. 892, Otsego County, 23.64 miles; H. A. Murphy, Albany, N. Y., \$11,795.90; Sherman Contracting Co., Inc., Oneonta, N. Y., \$12,215.75; Nash & Griffin, Norwich, N. Y., \$12,787.45. Repair Con. 894, Otsego County, 7.76 miles; H. A. Murphy, Albany, N. Y., \$4,193; Nash & Griffin, Norwich, N. Y., \$4,425.20; Harry W. Roberts & Co., Utica, N. Y., \$5,179.50. Repair Con. 930, Rockland County, 7.30 miles; J. F. Gallagher & Co., Inc., Kingston, N. Y., \$25,716.30; John J. Guinan, Brooklyn, N. Y., \$28,490; Brady-Oltarch Cons. Co., New York City, \$28,962.05. Repair Con. 897, St. Lawrence County, 30.95 miles; Herbert W. Pearl, Potsdam, N. Y., \$8,573.31; Kellogg-Boynton, Keeseville, N. Y., \$8,860.20; Pathfinder Cons. Co., Fulton, N. Y., \$8,917. Repair Con. 906, St. Lawrence County, 20.49 miles; Spellman-Oliver Co., Chateaugay, N. Y., \$6,645.266; Kellogg Boynton, Keeseville, N. Y., \$6,827.47; Arthur F. McConville, Ogdensburg, N. Y., \$6,932.47. Repair Con. 918, St. Lawrence County, 2.52 miles; Arthur F. McConville, Ogdensburg, N. Y., \$12,841.35; John B. Dower, Ballston Spa, N. Y., \$13,927.30; Rumpf & Stevens, Lake Placid, N. Y., \$14,131.20. Repair Con. 908, St. Lawrence County, 53.61 miles; Kellogg Boynton, Keeseville, N. Y., \$15,759.85; Herbert W. Pearl, Potsdam, N. Y., \$15,786.20; Spellman-Oliver Co., Chateaugay, N. Y., \$15,966. Repair Con. 915, Seneca & Wayne Counties, 42.53 miles; F. H. Wells, Savannah, N. Y., \$15,964.81; Edwin Styring, Syracuse, N. Y., \$17,101.70; Kennedy Cons. Co., Albany, N. Y., \$18,108.30. Repair Con. 886, Steuben County, 63.12 miles; Kennedy Cons. Co., Albany, N. Y., \$26,517.97; McGreevey, McGuigan & Baum Co., Elmira, N. Y., \$26,737.01. Repair Con. No. 924, Suffolk County, 1.75 miles; Gifford Cons. Co., Jamaica, N. Y., \$18,048.40; Edward F. Monahan, Manhattan Beach, N. Y., \$18,157.80; Helling Brothers, Lindenhurst, N. Y., \$20,816.40. Repair Con. 926, Suffolk County, 4.50 miles; Edward F. Monahan, Manhattan Beach, N. Y., \$13,429.80. Repair Con. 925, Suffolk County, 2.14 miles; Murray & Gardner, Inc., Center Moriches, N. Y., \$15,032.60. Repair Con. 882, Sullivan County, 23.20 miles; Armstrong & Trowbridge, Middletown, N. Y., \$6,907.40; G. C. Bennett, Liberty, N. Y., \$7,515.25; DeGraff & Hogeboom, Inc., Kingston, N. Y., \$7,897. Repair Con. 858, Tioga County, 25.29 miles; Dana W. Robbins, Inc., New York City, \$8,718.25; McGreevey, McGuigan & Baum Co., Elmira, N. Y., \$8,946.36; Kennedy Cons. Co., Albany, N. Y., \$9,345.30. Repair Con. 912, Washington County, 4.77 miles; Rumpf & Stevens, Lake Placid, N. Y., \$25,973.10; Wm. G. Fox, Saratoga Springs, N. Y., \$27,858.10; John B. Dower, Ballston Spa, N. Y., \$28,978.10. Repair Con. 868, Washington County, 28.76 miles; William G. Fox, Saratoga Springs, N. Y., \$9,675.35; Richard Hopkins, Troy, N. Y., \$9,790.10; Flood & Van Wirt Co., Hudson Falls, N. Y., \$9,922.05.

Buffalo, N. Y.—For construction of roads as follows: Harrison Engineering & Construction Co., \$16,976, for Transit road; Howard L. Meyer, \$46,370, for the Porterville road; Harrison Engineering & Construction Co., \$17,946.52, for the Abbott road; Cold Spring Construction Co., \$18,126, for Transit road; Cold Spring Construction Co., \$20,500, for Abbott road; Cold Spring Construction Co., \$49,500, for Porterville road; F. J. Mumm Contracting Co., \$27,474, for Transit road; Frank Cohen, \$29,000, for Transit road; Howard L. Meyer, \$26,365, for Abbott road; Howard L. Meyer, \$17,609, for Transit road; Harrison Engineering & Construction Co., \$47,311.35, for Porter-

ville road; F. J. Mumm, \$29,700, for Abbott road; Frank L. Cohen, \$30,000 for Abbott road, and \$62,400 for Porterville road.

Depew, N. Y.—Harrison Const. Co. for paving six streets with concrete at \$62,000.

Hudson, N. Y.—For repair work in this county covering 16.43 miles: Conway Bros. & Kennedy, Eddyville, N. Y., \$6,278.86; Gleason & Davitt, Albany, \$6,463.23; John T. O'Neill, Troy, \$7,028.80; Jos. Walker Construction Co., Albany, \$7,215.77. This includes coal oil and gravel on road from Hudson to Valatie and coal oil and crushed stone on Hillsdale to Massachusetts line road.

Lockport, N. Y.—For road work as follows: Fillmore Chapel-Ransomville Rd., in Porter and Lewiston, 5.94 miles, Mumm Construction Co., Buffalo, \$49,714.16; F. E. Dean, Youngstown, \$50,171.66; Beebe-Chestnut Rd., in Wilson, 5.273 miles, Bison Engineering & Construction Co., Buffalo, \$54,254.50; Mumm Construction Co., Buffalo, \$49,990. Warren's Corners, town of Lockport, 2.96 miles, Bison Engineering & Construction Co., Buffalo, \$31,448.10; Mumm Construction Co., Buffalo, \$32,418.52; C. B. Whitmore Co., Lockport, \$31,629.35; Busch & Percival, Buffalo, \$30,495.02; Harrodine Bros., Spencerport, \$26,556.02. Pendleton Town Line Rd., in Pendleton and Wheatfield, three miles, Mumm Construction Co., Buffalo, \$18,469; Gipp Co., Buffalo, \$17,266.

Lockport, N. Y.—Parradine Bros. Co., Inc., Spencerport, for Warren's Corners stone road at \$26,556.02.

Rochester, N. Y.—Low bidders for repairs on state highways in three counties, as follows: Repair Con. 874, Livingston and Wyoming Counties, 46.76 miles—Crouch Bros., Rochester, N. Y., \$13,956.22; Sweeney & Boland, Rochester, N. Y., \$13,961.87; Ribstein-Holter Co., Inc., Rochester, N. Y., \$14,227.65. Repair Con. 875, Monroe County, 43.63 miles—Crouch Bros., Rochester, N. Y., \$7,814.625; Chas. F. Gallagher & Bro., Rochester, N. Y., \$9,261.85; Whitmore, Rauber & Vicinus, Rochester, N. Y., \$9,468.26.

Rochester, N. Y.—For pavements as follows: Burlington Ave. asphalt, *Rochester Vulcanite Pavement Co., \$12,706.80; Haag's alley, asphalt, *Whitmore, Rauber & Vicinus, \$8,537; Parker alley, asphalt, *Whitmore, Rauber & Vicinus, \$6,300; Westchester Ave., asphalt, *Julius Friedrichs, \$15,717.50; Raeburn Ave., asphalt, *Rochester Vulcanite Pavement Co., \$14,622.60.

Rochester, N. Y.—See "Sewerage—Contract Awarded."

Rochester, N. Y.—See "Sewerage."

Syracuse, N. Y.—Warner-Quinlan Asphalt Co. for supplying city with fluxed asphalt at \$18 per ton.

Watertown, N. Y.—For repairing of 34 miles of state roads in Jefferson County and 17 in Franklin County, as follows: Rock & Griffin, of this city, were low bidders on contract No. 904, which calls for resurfacing of Theresa-Antwerp highway, at \$12,746.57. Road is over 2 miles long. Richard Hopkins, of Troy, was low bidder for contract No. 863, for oiling with cover coat stretch of about 32 miles on highways in Jefferson County, including parts 1 and 2 of the Redwood-Alexandria road; part 2 of the Watertown-Theresa; part 2 of the Cape Vincent-Watertown; the Black River-Watertown and the Antwerp County line roads. His bid was \$10,596.02. On repair contract, No. 907, calling for resurfacing of about 17 miles of roads in Franklin County, the firm of Kellogg-Boynton of Keeseville was low. Their bid was \$5,387.60.

Yonkers, N. Y.—W. F. O'Connor, for supplying 50,000 gallons of road oil at \$2.95.

Mandan, N. D.—S. Birch & Sons for paving with bitulithic at \$160,000.

Canton, O.—Reported that contract will be awarded to Smith & Krabill, local, for improving 5.78 miles of Canton-Akron road in Stark county at \$124,462, estimated cost of work being \$135,661.78.

Madison, O.—Public Contracting Co., Elyria, O., at \$32,750 for 3.01 miles of improved road on Lincoln Highway.

Piqua, O.—Hennessey & Bro., for paving Nicklin Ave. with Bermudez asphalt on 6-in. concrete base, at \$25,803.

Piqua, O.—For paving of West Ash, West Green and West North Sts.; *Andrews Asphalt Paving Co., of Hamilton. Streets are to be paved with five-inch concrete base and Trinidad asphalt.

Urbana, O.—Lowest bidders for paving

Miami St. were Edward Murray, Dayton, O., and Bigler Bros., Middletown, O., as follows: Murray using Townsend brick, \$18,342.50; Hocking \$18,686.50; Metropolitan \$18,342.50; Medal, \$18,686.50; Webster \$18,686.50; Nelsonville \$18,368.50. These figures are for paving from High St. to railroad, and Bigler's figures for same contract are as follows: Hocking \$18,262; Metropolitan \$18,864; Webster \$18,103; Tribble \$19,348; Peebles \$18,348. Murray's figures for west end of street are Townsend, Nelsonville or Metropolitan brick \$24,833; Hocking, Medal or Webster, \$25,357; Bigler's figures are Hocking \$25,333; Metropolitan \$26,162; Webster \$25,096; Trimble or Peebles \$25,451.

Urbana, O.—D. C. Fox, Bellecenter, Ohio, for state highway between Bellefontaine and West Liberty, at \$25,744.52.

Youngstown, O.—For paving, grading and sewerage as follows: Crescent St. paving, *M. F. Clark, \$9,117.50; Lauderdale Ave. sewerage and paving, *M. F. Clark, at \$2,362.45; Bellevista Ave. grading, *Charles Harris, at \$9,029.90; Center St. paving, *Miller & Quinn, at \$94,75, and lumber for replanking Center St. bridge, *Heller Bros., at \$2,052.

Bellevue, Pa.—Central Construction & Supply Co., for paving.

Franklin, Pa.—For supplying cement: James Lumber Co., \$1.75 a barrel for Crescent Portland, delivered in waterproof paper sacks. They submitted another bid on Atlas brand, \$1.89 in cloth sacks, to be unloaded by city. Paper sacks, 30 cts. a barrel less. Five cts. per barrel off for cash. Howard Lumber & Coal Co., on Universal Portland, carload quantities, \$1.89 in cloth sacks, less 40 cts. when sacks are returned, city to haul from cars. Delivered from warehouse, \$1.98 per barrel, with similar rebate for sacks returned. Franklin Lumber Co., in 1,600 barrel lot, approximately \$1.89 per barrel in cloth sacks, unloaded by city. Paper sacks, 30 cts. a barrel less. Five cts. a barrel off for cash. Universal Portland Cement Co., \$1.94 in cloth sacks. Five cts. discount for cash in 10 days.

Harrisburg, Pa.—W. H. Murphy & Sons, for grading section of Brookwood St.

Harrisburg, Pa.—For supplying bituminous road material as follows: *Bartlett Co., New York, for three districts; *United Gas Improvement Co., Philadelphia, Pa., for one district.

Johnstown, Pa.—For one-course reinforced concrete pavement, brick on 6-in. concrete foundation, cement grout filler, as follows: John W. Best & Son, \$19 Franklin St., Johnstown, brick at \$1.73 per sq. yd.; asphalt, \$1.95 per sq. yd.; concrete at \$1.45 per sq. yd.; 60 to 90 cts. excavation, total, \$17,782.54; Geo. W. Clark, 1060 Franklin St., brick at \$1.92 per sq. yd.; av. sq. yd., \$2.25; excavation, 55 cts. per cu. yd.; total, \$2,487.34. J. R. Crissey is City Engr.

Wilkes-Barre, Pa.—Joseph Banks Construction Co., for paving Garnet lane and Rees St. with Mack brick at \$2.24 per sq. yd. and White Haven red stone at 80 cts. per lin. ft.

Wilkes-Barre, Pa.—For paving on 15 streets: *Warner-Quinlan Co., at following bid: Asphalt work will be done under 10-year maintenance clause at \$1.89 per sq. yd. White Haven red stone curbing will be laid at 79 cts. per lin. ft. Brick will be done with Belgian block at \$3.35 per sq. yd. and with Mack brick at \$2.30 per sq. yd.

Bartlett, Tex.—For 15,500 sq. yds. brick pavement, 5-in. foundation, 2,300 cu. yds. macadam excavation, 4,700 cu. yds. earth excavation: *Levy & Levy, Dallas, Tex., at \$1.90 per sq. yd. for paving, 30 cents per cu. yd. for macadam excavation, 30 cents per cu. yd. for earth excavation; Standard Paving Co., San Antonio, Tex., at \$2.06, 90 cents and 34 cents respectively; General Const. Co., Fort Worth, Tex., at \$1.96, 40 and 30 cents respectively; Kaw Paving Co., Taylor, Tex., at \$1.97, 42 and 32 cents respectively. R. T. Smith is City Engineer.

McKinney, Tex.—Kaw Paving Co. for paving Improvement District No. 4, with Texaco asphalt. Charles Schultz is Civil Engineer.

Salt Lake City, Utah.—For paving 6,584 sq. yds. with bitulithic, Ex. No. 118, 17,195 sq. yds., with sheet asphalt C. Ex. No. 114, with 4-in. crushed rock foundation and concrete foundation with 5-in. base, 1 1/2-in. binder, 1 1/2-in. topping, respectively, 2,300 cu. yds. gravel excavation and 12,836 cu. yds. gravel sand and loam excavation, respectively, as follows:

Ex. 118. *Strange-Maguire Paving Co., Salt Lake City, \$2.20 per sq. yd. for paving, 90 cts. for excavation, total \$19,025.43; J. W. Mellen, Salt Lake City, \$2.35, 75 cts., \$19,577.40; P. J. Moran Contracting, Inc., \$2.32, 85 cts., \$19,612.19. Ex. No. 114, *P. J. Moran Contracting, Inc., Salt Lake City, \$2.24 for paving, 76 cts. for excavation, total \$76,107.11; Strange-Maguire Paving Co., Salt Lake City, \$2.28, 80 cts., \$76,542.67; J. W. Mellen, Salt Lake City, \$2.25, 80 cts., \$76,653.91. S. Q. Cannon is City Engr.

Sheboygan, Wis.—*Pestain & Naumann at \$37,828.55 for concrete pavement on North 11th St.

Sheboygan, Wis.—For grading North 6th St.: Otto Naumann at \$1,105.20; Herr & Braun at \$1,192.60.

SEWERAGE

Los Angeles, Cal.—Petition for sewers on two streets granted and referred to City Engineer for necessary ordinance.

Richvale, Cal.—Trustees of Drainage District 100 have called election for May 20, at which question of bonding district for \$150,000 for improvements will be voted on. It is planned to drain the district by the construction of 79 miles of ditches, with an outlet into Butte Creek. Engineers have been at work on project for preliminary plans for several months. Frank S. Robinson of Chico is engineer.

Fort Wayne, Ind.—Board of works has ordered plans for sewer in alley between Wheeler and Richardson Sts., from the G. R. & I. to Nickel Plate Railroad tracks, and for paving several alleys.

Marshalltown, Ia.—Resolution of necessity passed on sewer project provides for about 10,000 lin. ft. of sewer ranging in size from 6 to 10 ins. in 18 different streets in all parts of city. Engineer ordered to prepare plans and specifications and council will hear objections May 22, at 9 o'clock. W. H. Steiner is city engr.

De Ridder, La.—Work has been started by Sutherland Const. Co., of Kansas City, Mo., on sewage system to be installed here.

Saco, Me.—Council considering several petitions for sewers and drains. On petition for continuation of sewer on Lincoln St. committee on sewers and drains was empowered to act.

Bay City, Mich.—Council has authorized construction of sewers in several streets. Lovell M. Grant is Recorder.

Duluth, Minn.—Council also ordered sanitary sewers in Faribault St. from Maxwell Ave. to Kolstad, the estimated cost being \$2,390, and in Fifth alley from 22d to 23d Ave. west, the estimated cost being \$1,122.

Kansas City, Mo.—See "Miscellaneous."

Bayonne, N. J.—See "Streets & Roads."

Elizabeth, N. J.—See "Streets & Roads."

Hoboken, N. J.—Board of Commissioners have given notice of intention to make sewer improvements. Daniel A. Hagerty is City Clerk.

New Brunswick, N. J.—Petition asking for sewer on Handy St. has been referred to Director of Streets and Public Improvements.

Somerville, N. J.—Ordinance passed on first reading for construction of sewer on Doughty Ave.

Somerville, N. J.—Borough Council voted favorably upon ordinance authorizing expenditure of not more than \$9,000 for construction of sewer on East Main St. for distance of about 2,000 feet.

Spring Lake, N. J.—Ordinance has been passed providing for construction of proposed sewer system from Ocean Ave. into Ocean Rd., Villa Park.

Binghamton, N. Y.—Board of Contract will authorize secretary to advertise for bids for several sewers and Board of Estimate will give Commissioner of Public Works right to do the High School grading and to purchase turbine sewer cleaning machine in open market.

Binghamton, N. Y.—Council will order sewers to be constructed in two streets.

Brooklyn, N. Y.—Resolutions have been adopted by Newtown local board for construction of sewers in Hughes St. and Sedgwick St. and for regulating and grading sidewalks in several streets.

Buffalo, N. Y.—Council has authorized bond issues of more than \$1,000,000 for public improvements. Amounts of bonds and the purposes for which money will be used are: School buildings and sites, \$600,000; building of a trunk sewer in Seneca and Swan Sts. from Hydraulic to Hamburg St., \$150,000; new voting ma-

chines, \$95,000; completion of the Broadway market, \$36,000; land needed for the building of a drain in the northeastern part of the city along Scajaquada Creek, \$53,915; elimination of grade crossings at Walden Ave., Doat and Genesee Sts., \$108,000; construction and equipment of police and fire buildings, \$6,000; water bureau, \$177,500.

Oriskany, N. Y.—Village will vote again May 8 on proposition to issue \$40,000 in bonds for sewer construction. Morrison & Quinn, of Rochester, who put in low bid of \$30,346, have consented to hold their proposal open until result of election is known. If proposition is carried work will be started within a week and completed before Jan. 1, 1917.

Watertown, N. Y.—Council has authorized board of public works to award contract for construction of a sanitary sewer in East Ave.

Bowling Green, O.—Resolutions have been passed providing for construction of sanitary sewers in several streets.

Chester, Pa.—Ordinance adopted for construction of sewer on Edgmont Ave.

Youngstown, O.—See "Streets & Roads."

Tulsa, Okla.—See "Water Supply."

Harrisburg, Pa.—Council has been petitioned for sewer connection in 21st St.

Pittsburgh, Pa.—Finance committee of City Council has approved ordinances for Councilmanic bond issues amounting to \$350,000 for storm water sewer in Nine Mile Run and for widening, straightening and improving Sawmill Run.

Westerly, R. I.—Special meeting will be held May 25 to take action on recent act passed by legislature authorizing town to construct sewerage system. Meeting must be held within 60 days from time act was passed for the electors to vote for or against same.

Canadian, Tex.—City has sold \$25,000 worth of sewerage warrants and modern sewage system will be installed this summer. Engineers are here now making surveys for lines, etc.

Childress, Tex.—City council has about completed arrangements for building of \$30,000 sewer system, and work will start soon, covering entire town.

Burlington, Vt.—Plans being discussed for construction of sewers in Lyman Ave. and Foster St. It has been voted to authorize laying of sewer in Cedar St.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates contract awarded.)

Stockton, Cal.—*W. S. Gause, Piedmont, Cal., for constructing sewer at \$13,710.

Pueblo, Colo.—*P. J. Ryan, for sewer extension in Arvonla addition.

Bridgeport, Conn.—*Pierce Mfg. Co., for 150 ft. of sewers on Chalmers Ave., at \$498, and 780 ft. on Park Ave. at \$2,048.

Springfield, Ill.—For 12-in. crock pipe sewer in Capitol Ave. between 20th St. and Jassamine Ave., a distance of 1,315 feet: *Henry Nelch & Son, at 58 cents a lineal foot; inlets 45 cents; and manholes \$23. Spence & Son, sewer 64 cents; inlets, 45 cents; manholes, \$24. J. O. Patteson & Co., sewer, 58 cents; inlets, 40 cents, and manholes, \$25.

Boston, Mass.—For pipe sewers and drains in West Roxbury: *James L. Pierce, at \$639.00. Three next lowest bidders: John F. Lynch, \$787.60; Jas. Driscoll & Sons Co., \$797.00; Frank Drinkwater, \$810.00. Engineer's estimate, \$885.60.

Boston, Mass.—For pipe sewers and drains in Brighton: *Regan, George J., at \$2,496. Three next lowest bidders: Pierce, Jas. L., \$2,914; Baruffaldi, Anthony, \$3,008; Guarino, John, \$3,090. Engineer's estimate, \$3,311.25.

Boston, Mass.—For sewerage works across Albany and East Dedham Sts.: *Barrott, William, & Co., \$5,399.10; Baruffaldi, Anthony, \$5,496.05; Daddario & Booth, \$6,647; Costello, John A., & Co., \$7,124.

Boston, Mass.—For sewerage works in Dorchester: *Pierce, Jas. L., at \$761.20. The next lowest bidders: Loomie, M. H., \$916.91; Coughlin, Timothy, \$917.40; Grando, Vinconso, \$938.60. Engineer's estimate, \$954.

Lake Crystal, Minn.—*Arthur A. Dodson Co., Lincoln, Neb., for trunk line sewer pipe at \$11,900.

Roseau, Minn.—For construction of County Ditch No. 24: *Northwestern Drainage Co., of Thief River Falls, for excavating at 11.7 cts. per cu. yd. Julian Brown, of Warroad, will do leveling at

\$74.50 per mile and haul and install the culverts for \$135. Culvert contract went to Wheeling Corrugating Co., of Minneapolis. Carlquist & Russell, of Warroad, were awarded bridge contract at \$6.45 per ft., and Mike Zenner, of Cedarbend, was awarded clearing at \$346.

New Brunswick, N. J.—*Abraham Jel-in, for construction of Mile Run sanitary trunk sewer at \$10,657. Eugene J. McLaughlin is City Clerk.

Somerville, N. J.—*Smith & Coyne, Newark, N. J., for construction of sewer on North Davenport St.

Albany, N. Y.—*Peter Keeler Building Co., Albany, for completion of sewage disposal works at Westerlo Island at bid of \$131,872.65.

New York, N. Y.—*Clancy & Van Alst, 460 Lockwood St., Long Island City, for constructing sewer in Kingsland Ave., at \$38,800.

Rochester, N. Y.—For sanitary and storm water sewers in Clinton Ave. North: *John Petrossi, at \$11,003.80; Merwin St. sewer, walks and grading: *Jas. Passerto, \$7,217.90; Walnut St. brick pavement, *Frank Brotsch, \$14,677; Marlborough road asphalt pavement, *Whitmore, Rauber & Vicinus, \$19,492.30.

Rochester, N. Y.—Constructing screen and pump houses complete: *A. Friedrichs Sons Co., \$42,639; installing heating and ventilating system in screen house, *Arensmwyer, Warnock & Zahndt, \$6,430.

Yonkers, N. Y.—For construction of sewers, as follows: M. J. Nolan, at \$9,393.15; *Thomas Grady, for \$4,700.45; *Joseph Cuzzo, at \$1,885.54.

Columbus, O.—*J. F. Ryerson for sewer at \$1,883.85. Other bidders were as follows: Monarch Construction Co., \$1,912.79; Ames Bros., \$1,895.08; Franklin County Construction & Equipment Co., \$2,332.15; H. G. Howell, \$2,183.85.

Struthers, O.—For construction of tile and brick sewers as follows: For Marion Ave. sewer, Harris & Labato, Youngstown, Ohio, at \$1,895.60; Dell & Serafino, Youngstown, at \$1,803.89. For Spring St. sewer, Harris & Labato, at \$4,309.20; Dell & Serafino, at \$4,310.87. A. Richards is City Clerk.

Urbana, O.—For storm sewer on Miami St. as follows: Philip Hounker, Springfield, \$2,423.30; J. A. Swingle Contracting Co., Zanesville, \$2,590.70; Boyd & Chavis, Urbana, \$2,740.65; Charles F. Smith & Co., Dayton, \$2,797.85.

Harrisburg, Pa.—For 130 ft. of 10-in. terra cotta pipe sewer as follows: W. Opperman, at \$274; Henry Opperman, at \$286; Geo. W. Ensign, Inc., at \$275; Stucker Bros. Const. Co., at \$288.

Norristown, Pa.—For constructing 465 ft. 8-in. vitrified pipe sewer: John S. Kelly, at \$1.95 per lin. ft., including 2 manholes. Flush tank, 350 gals., \$125; house laterals \$1.65 per lin. ft. S. Cameron Corson is Boro. Engineer.

Wilkes-Barre, Pa.—For constructing approximately 4 miles of 6-in. to 15-in. terra cotta pipe sewers at Miners Mills, Pa.: *Jos. Banks Const. Co., local, at \$15,620.25; Herrick Const. Co., local, at \$16,975.65; P. J. Finn, Miners Mills, Pa., at \$17,926.60; D. M. Rosser, Kingston, Pa., at \$20,004.75; R. M. Rosser, Kingston, Pa., at \$17,943.30. Manholes, \$35 each, for 6-ft. plus \$4 per ft. additional. Young & Wintermute are Engineers.

Ipswich, S. D.—*George A. Dean, Alexandria, S. D., for clay pipe sewer as follows: 10-in. sewer at \$1; 8-in. sewer at 94 cts., total \$3,138.38. Dakota Engineering Co., Mitchell, S. D., are Engrs.

Winner, S. D.—Sewers and disposal plant: *C. H. Green, Spokane, Wash., at \$20,781.60. Includes cement pipe from 8 to 15 ins.

Columbus, Wis.—*Thos. E. Wooley, for 1,230 ft. 15-in. vitrified tile sewers at \$1,627.

WATER SUPPLY

Benicia, Cal.—Chlorination plant for treatment of all water supplies for city of Benicia, Solano county, is being installed by Benicia Water Co.

San Diego, Cal.—Wood stave, iron banded, was recommended to council as cheapest and best material for pipe line to connect Upper Otay reservoir with diverting dam being constructed on Harvey ranch. Distance is about 4½ miles and purpose is to bring Morena reservoir water into Upper Otay direct.

San Rafael, Cal.—Directors of Marin municipal water district voted to reject all bids for \$2,250,000 block of bonds offered for sale out of \$3,000,000 issue

voted several months ago for acquiring municipal ownership of water-serving companies in southern Marin. Two bids were received, one at par and another at \$100.10 for each \$1,000 bond. Directors will not readvertise until after validity of water district act has been decided by Supreme Court in test case now before that body.

Dover, Del.—Council has made plans for extensive improvements during year, most important of which will be resurfacing of Locckerman St. and part of State St., and the installation at water and light plant of new engine and generator. Council also contemplates installation of a new electric wiring system.

Wilmington, Del.—Bids for construction of a 12-million-gal. mechanical filter plant and appurtenances to the present pre-filter building of this city will be opened by the Board of Water Commissioners on Friday afternoon, May 12. The work is to be finished by March 1, 1917.

Athens, Ga.—Citizens have voted in favor of \$40,000 bond issue for extension and improvement of water works system.

Rome, Ga.—Extension of water mains has been recommended.

Pocatello, Ida.—Public utilities commission has arrived here to aid in settling details whereby city will construct municipal \$400,000 water system.

Quincy, Ill.—Construction of new base in city reservoir has been recommended.

Huntington, Ind.—Special session of City Council will be held to consider issuing bonds to amount of about \$17,000 to pay city's share of new ornamental lighting system and to improve air lifts on city water works wells.

Lawrence, Kan.—The firm of Black & Veatch of Kansas City has been recommended by advisory water committee as proper engineers to plan improvements for water works system. City commission will take official action on the recommendation later.

Lake Charles, La.—Plans have been completed for water works improvements, consisting of new pumping plant, machinery and 15 miles of mains. Estimated cost, \$150,000. Burns & McDonnell, Interstate Bldg., Kansas City, Mo., are Engineers.

Saco, Me.—Biddeford & Saco Water Co. granted permission to extend its pipe line on outer Main St. and install two hydrants, work to be done without expense to the city.

Lowell, Mass.—William W. Duncan, commissioner of finance, is prepared to call for bids for sale of city bonds, aggregating \$164,000. These bonds will be sold to highest bidder and are as follows: \$55,000 for water main extensions, to be borrowed on a five-year loan; \$8,000 for new sidewalks, to be borrowed on a two-year loan; \$61,000 for macadamizing, to be borrowed on a 10-year loan, and \$60,000 for additions to schools, to be borrowed on a 20-year loan.

Kansas City, Mo.—Council has appropriated \$118,000 for fire and water board.

Glendive, Mont.—Bond election May 15 for \$65,000 for filtration plant. Burns & McDonnell, Interstate Bldg., Kansas City, Mo., are Engineers.

Livingston, Mont.—Question of municipally owned water system has been in process of litigation for some years and some few months ago city received favorable decision in lower or district court. Water Company appealed to Supreme Court and hearing should be obtained shortly. Will S. Hartman is City Engr.

Bayonne, N. J.—See "Streets & Roads."

Kenilworth, N. J.—Council will confer with Plainfield Union Water Co. regarding laying of water main in Eighth St.

Batavia, N. Y.—Common Council has vetoed bill providing for vote of the people on proposition to take \$25,000 from general funds for special improvements, including installation of pure water system.

Buffalo, N. Y.—See "Sewerage."

Poughkeepsie, N. Y.—Town will vote May 25 on bond issue of \$240,000 for extension of city's water main distribution system.

Syracuse, N. Y.—Clerk R. D. Roney was directed to advertise for bids for supplying Bureau of Water with from 15,000 to 25,000 lbs. of lead pipe.

Watertown, N. Y.—Robert E. Horton, of Albany, civil engineer and expert on water supplies and developments, will assist in investigation of Pine Plains water supply which will be conducted by city within a short time. Investiga-

tion will be conducted under direction of City Engineer Earle W. Sayles.

Hickory, N. C.—Recently voted \$35,000 bond issue for new school building and water and sewer extension brought a premium of \$1,321, successful bidder being the Wachovia Banking & Trust Co. of Winston-Salem. They agreed to pay in addition accrued interest from May 1 until bonds were delivered to them, they to have bonds engraved and also to pay all attorney fees. Their bid for \$25,000 school bonds was \$25,830, and for \$10,000 water bonds, \$10,491.

Bowling Green, O.—Petition for extension of water mains referred to committee.

Tulsa, Okla.—Kendall will on May 2 vote upon proposition of \$60,000 of municipal bonds for sewer and water systems which ultimately will be taken over by Tulsa.

New Castle, Pa.—Water company will install 20-in. mains along Highland Ave. J. H. Simpson is Superintendent.

Ogden, Utah.—Petition for 2-inch water main on "E" Ave. and Robins st., in West Ogden referred to superintendent of waterworks.

Sistersville, W. Va.—Election will be held shortly to vote on bond issue for installation of two million gallon rapid sand filtering system for water works. C. E. Lindsley is Water Commissioner.

Sheboygan, Wis.—A 4-in. water main was ordered placed in Lincoln Ave. from North Fifth to Sixth Sts. Other water mains were ordered in several streets.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates contract awarded.)

Rector, Ark.—For constructing water works and sewers: *Sullivan, Long & Hagerty, Bessemer, Ala., at \$54,000. Will include 5 miles 4 to 8-in. cast iron water main, tower and tank, pumping station, etc., and 6 miles pipe sewer, settling tanks, etc.

Calxico, Cal.—For constructing water works extensions: *H. R. Boynton Co., at \$21,864.

San Diego, Cal.—For supplying wood pipe as follows: Charles R. McCormick Lumber Co., at \$52,616, the work to be completed in 90 days; Pacific Tank & Pipe Co., \$48,250, the work to be finished in 70 days; Redwood Mfg. Co., \$65,244, in 85 days, and Doran & Armstrong, \$56,250, in 100 days. Lowest bid for 36-in. steel pipe was by Western Pipe & Steel Co., for \$62,853, work to be completed in 120 days. Other bids for steel pipe: Baker Iron Works, \$67,663, in 100 days; Lacey Mfg. Co., \$64,464, in four months; Los Angeles Mfg. Co., \$84,846, in eight months.

Tustin, Cal.—For concrete reservoir: *Paul Carnahan, Santa Ana.

Wilmington, Del.—*William D. Hadcock & Co. for making alterations and additions to pumping station and gate house at Cool Spring Park. Work will cost \$2,110.

Ocala, Fla.—*Benjamin Thompson Co., Tampa, Fla., at \$97,254, for constructing combined water works and electric light plant.

Metropolis, Ill.—For water works supplies as follows: American Cast Iron Pipe Co., Birmingham, Ala., for 4-in. c.i. "C" electric light switchboard in gas works, 3/4 cts. per lb.; U. S. Cast Iron Pipe Co., at \$32.10 and 3/4 cts., respectively; *American Cast Iron Pipe Co., 16 ft. lengths at \$33.10 and 3/4 cts., respectively. P. M. Richards is Supt.

Dudd, Ia.—For 200-ft. well: *J. B. Love, New Hampton.

Boston, Mass.—For laying water pipes in Dorchester, West Roxbury and Hyde Park: *James Bartola, \$1,938.30; John T. Shea, Jr., \$2,120.80; Hugh McNulty, \$2,251.30; John F. Lynch, \$2,519.80; Roger F. Cushing, \$2,806.10; John Guarino, \$3,388.50. Engineer's estimate, \$2,270.

New Bedford, Mass.—*Benjamin F. Watkins, 520 Acushnet Ave., New Bedford, at \$16,774, for constructing concrete pumping station.

Marquette, Mich.—For 2,550 ft. 90-in. and 100 ft. 66-in. Oregon fir wooden stave pipe for new aqueduct: *Pacific Coast Pipe Co., Seattle, at \$3.85 and \$2.85 per lin. ft., respectively; for steel bands every 3 in. at \$1.94 each for large size and \$1.50 for smaller size; total, \$24,684.

Seattle, Wash.—*Herbert Young, 2416 East Valley St., at \$13,479, for water mains in Orcas and other streets.

Duluth, Minn.—*Simon Johnson awarded contract to lay gas and water extensions at \$5,882. *A. Hodenberg awarded contract to lay mains at \$1,705. *Wood-

ruff Lumber Co. awarded contract to supply city with 250,000 ft. of Norway pine and tamarack on its bid of \$6,028.

Duluth, Minn.—*Marshall-Weils Co. for furnishing water and light department with 10,000 lbs. of pig lead at \$327. **Peekskill, N. Y.**—For furnishing iron pipe and fittings: *Standard Cast Iron Pipe & Foundry Co. of Bristol, Pa., at \$5,616.40. For hydrants and valves, *R. D. Wood & Co., for \$951.

Euclid, O.—For constructing water mains: *Gould & Maybach, Cleveland, O., at \$15,946.

Youngstown, O.—*Dravo-Doyle Co., Diamond Bank Building, Pittsburgh, Pa., at \$21,750 for designing, construction, delivery and erection of two 18-in. and one 12-in. centrifugal pumps, together with motors, switchboards, wiring and underground conduits.

Harrisburg, Pa.—*Gamon Meter Co., Newark, N. J., for furnishing water meters at \$2,400.

Columbia, S. C.—For high velocity water filtration plant, 6 units, Million gallon units, with building: *New York Continental Jewell Filtration Co., 15 Broad St., New York City, low bidder at \$43,851 and \$35,095; Pittsburgh Filter Mfg. Co., Pittsburgh, Pa., at \$47,550; Tucker & Laxton, Charlotte, N. C., at \$40,096 and \$46,256; Municipal Engr. & Const. Co., Atlanta, Ga., at \$47,820 and \$47,710. John McNeal is City Engineer.

Blackstone, Va.—For water works for city as follows: Pumphouse, motor and crude oil engines, *V. Bacagilupo, Richmond, Va.; tank and tower, *Des Moines Steel Co.; centrifugal pumps, *Platt Iron Works; pipe laying, *Kelly & Ambrecht, Richmond, Va.; deep well pump, *Snyder Pump & Well Co. Saville & Claiborne, Inc., are engineers.

South Boston, Va.—*A. K. Stewart & Son, at \$44,684, for constructing water works system.

Wittenberg, Wis.—*Goulds Mfg. Co., Chicago, Ill., \$570 for furnishing city with pump; *Stover Engine Works, Freeport, Ill., at \$485 for furnishing engine.

MISCELLANEOUS.

Birmingham, Ala.—Plans are being discussed for purchase of Roden hotel property and turning it into municipal building and auditorium at estimated cost of \$450,000 to \$500,000.

Brooklyn, N. Y.—Contract to be advertised shortly is station finish for Lexington Ave. subway. May 15 is date for public hearing on application of B. R. T. for an extension of its surface line system on Eighth Ave., from 39th St. to Bay Ridge Ave.; from Fresh Pond Rd. to Myrtle Ave., thence to Metropolitan Ave., Dry Harbor Ave. and Jamaica Ave.

Buffalo, N. Y.—Council considering plans to sell city's interest in city and county hall for \$700,000 and build modern municipal office building at approximate cost of \$800,000. Supervisors are willing to acquire city's interest in building for that amount.

Sparta, N. C.—County Commissioners have ordered election to be held June 10 to decide whether Alleghany shall issue \$60,000 additional bonds to Elkin & Alleghany Railways, \$2,000 to be issued for each mile built in county, and whole to be completed by December 31, 1920, or bonds forfeited.

Springfield, O.—Orders have been placed by Donald Kirkpatrick, chairman, and City Manager Ashburner, representing public playgrounds committee, for new apparatus sufficient to equip two additional recreation centers.

Dallas, Tex.—Citizens have voted \$110,000 bond issue for levee construction.

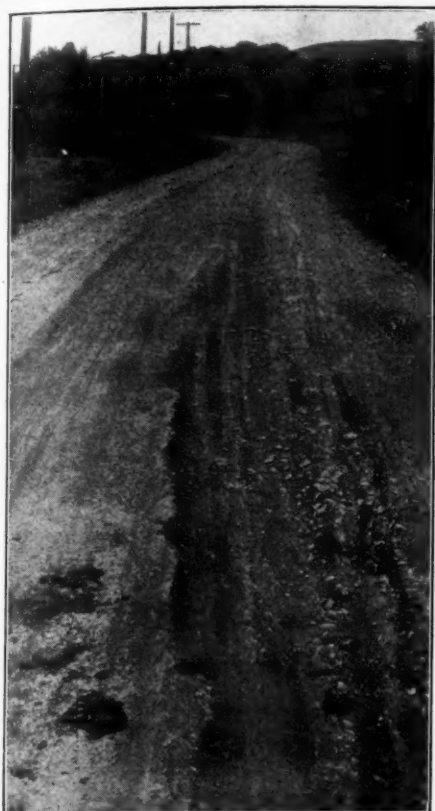
El Paso, Tex.—Public market will be built on Florence St. at cost of between \$100,000 and \$125,000.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates contract awarded.)

Butte, Mont.—For construction of garbage incinerator: Jones Bros. Macon, Ga., 30 tons capacity, \$13,500 (guarantee to keep in repair free for one year); Nashville Bridge Co., \$37,500; Decarie Incinerator Co., Minneapolis, 50-ton capacity, \$40,800; 40-ton capacity, \$34,600.

Newton, N. J.—For stone-crusher as follows: Good Roads Machinery Co., two bids of \$750 on machines of different sizes; Acme Road Machinery Co., \$810 and \$992; Universal Road Machinery Co., \$855 and \$1,273; Austin-Western Road Machinery Co., \$985 and \$1,105; and C. G. Buchanan Co., \$1,100.



Forest Lawn Road, Florence, Neb., showing condition of road before the use of "Tarvia-X"

Before and after —

BEFORE this road was tarviated it was difficult to keep the surface in decent condition on account of the automobile traffic. The swift thrust of automobile driving wheels disintegrated the surface and the expense of maintaining the road in good repair was large.

When it was resurfaced in June, 1915, the road was bonded with "Tarvia-X."

The Tarvia forms a tough, plastic matrix about the stone, cementing it into a concrete. Automobile wheels instead of destroying the surface will compact it and help to preserve it.

Tarvia

*Preserves Roads
Prevents Dust*

The use of the Tarvia added a little to the cost of the resurfacing of the road, but this will soon be repaid in the *reduced cost of maintenance*. This road surface is waterproof and develops no dust or mud.

Scores of communities now are using Tarvia regularly year after year simply for the sake of keeping down road expenses. There are three kinds of Tarvia and a dozen ways of using them to meet various road problems.

Booklets on request. Address our nearest office.

Special Service Department

This company has a corps of trained engineers and chemists who have given years of study to modern road problems.

The advice of these men may be had for the asking by any-

one interested.

If you will write to the nearest office regarding road problems and conditions in your vicinity, the matter will have prompt attention.

The *Barrett* Company



New York	Chicago	Philadelphia	Boston	St. Louis
Cleveland	Cincinnati	Pittsburgh	Detroit	Birmingham
Kansas City	Minneapolis	Salt Lake City	Seattle	Peoria
THE PATERSON MANUFACTURING CO., Limited: Montreal Toronto				
Winnipeg	Vancouver	St. John, N. B.	Halifax, N. S.	Sydney, N. S.



Forest Lawn Road, showing transformation of road surface after the use of "Tarvia-X"

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Mass.	Boston	noon, May 15	Granite block or Hassan pavement	E. F. Murphy, Com'r Public Works.
la.	Monona	6 p.m., May 15	Cement crossings and sidewalks during 1916	H. S. Rittenhouse, Town Clk.
la.	Nevada	7:30 p.m., May 16	14,000 sq. yds. of pavement and 8,000 ft. of curb	R. A. Davis, City Clerk.
N. J.	Rahway	8 p.m., May 16	12,000 gals. heavy bituminous oil	City Engineer.
Mass.	Boston	noon, May 16	6,100 ft. state road surfacing	Mass. Highway Commission.
Wash.	Spokane	May 18	Grading, curbing and sidewalking; cost \$6,000	City Engineer.
Minn.	Breckenridge	10 a.m., May 18	Turnpiking and grading roads	P. E. Truax, Co. Auditor.
N. Y.	New York	2 p.m., May 19	Repaving with sheet asphalt and granite block	M. M. Marks, Boro President.
N. J.	Elizabeth	2:30 p.m., May 19	10,000 sq. yds. amiesite road repairs	J. L. Bauer, Co. Engineer.
O.	Youngstown	1 p.m., May 22	14,220 ft. slag macadam	F. H. Vogan, Clerk, County Commissioners
O.	Fayette	noon, May 23	Concrete, asphalt block or brick pavement	C. D. Hause, Village Clerk.
O.	Cleveland	10 a.m., May 24	Grading and improving streets	W. A. Stinchcomb, Co. Surv.
Pa.	Union City	8 p.m., May 24	Curbing and paving 1,560 ft. of streets	H. B. Johnson, Boro Sec'y.
Ind.	Warsaw	1 p.m., May 26	Constructing gravel roads	V. D. Mock, Co. Auditor.
Texas	Fort Worth	June 6	Paving one mile of streets	City Secretary.
La.	Terrebonne	noon, July 5	Constructing 11.7 miles sand-clay-gravel roads	T. B. Smith, Eng., Houma, La.
SEWERAGE.				
Minn.	Anoka	8 p.m., May 18	Sewage treatment plant and 45,000 ft. 8 to 24-in. sewers	Henry Lee, City Clerk.
N. Y.	L. I. City	11 a.m., May 18	280 tons hydrated lime for Bureau of Sewers	M. E. Connolly, Boro Pres.
Mich.	Davison	9 a.m., May 23	Tile drainage ditches	A. H. Reid, Co. Drain. Com'r.
WATER SUPPLY.				
Minn.	Red Lake Falls	8 p.m., May 15	Extending water mains	Joseph Perrault, City Clerk.
Mass.	Boston	noon, May 15	Laying water pipes in several streets	E. F. Murphy, Comr. of Public Works.
Minn.	Chisholm	1 p.m., May 20	Two centrifugal electric-driven pumps and motors	C. J. Sullivan, Supt. of W.W.
Neb.	Havelock	8 p.m., May 20	Extending water main (1,140 ft.)	A. J. Blount, City Clerk.
Del.	Wilmington	2 p.m., June 2	7½ million-gal. reservoir	E. M. Hoopes, Jr., Chief Engineer, Bd. of Water Com'rs.
Ind.	Hartford City	2 p.m., June 5	Water system at County Infirmary	J. L. McGeath, Co. Auditor.
MISCELLANEOUS.				
N. Y.	L. I. City	11 a.m., May 18	Collection and disposal of garbage and refuse	M. E. Connolly, Boro. Pres.
N. D.	Leith	2 p.m., May 20	Constructing 30 miles of telephone line	J. L. Cahill.
O.	Cincinnati	noon, May 22	8 to 16-h. p. oil tractor	Ernst Von Bargen, City Pur. Agent.
O.	Cincinnati	noon, May 22	Constructing fire engine house	W. J. Friedlander, Director Public Safety.
N. J.	Elizabeth	2 p.m., May 25	Disposal of garbage and refuse	Board of Public Works.

STREETS AND ROADS

Douglas, Ariz.—City Engineer has been directed to make plans and specifications for paving Tenth St.

Texarkana, Ark.—Plans are being completed for paving of West Side along State Line Ave.

Denver, Colo.—House and Senate has voted \$15,000 appropriation for construction of Colorado highway from Mancos to Gallup, where it will connect with Santa Fe trail.

Gary, Fla.—Election will be held June 6 to vote on bond issue of \$20,000 for paving.

Live Oak, Fla.—Commissioners planning to construct sand-clay road for distance of 34 miles through Suwannee County.

Brazil, Ind.—Citizens have petitioned Council for paving of Kruzan St. and for sidewalks on Ashley St. and Joseph St.

Indianapolis, Ind.—Ed. G. Sourbier, treasurer of Marion County, will receive bids until May 15th for purchase of \$19,000 worth of free gravel road improvement bonds, also two issues of \$38,000 and \$66,000 respectively free gravel road improvement bonds.

Lawrenceburg, Ind.—Board of County Commissioners has granted petition asking to pave four blocks in Walnut St. with vitrified brick. It is estimated that improvement will cost about \$200,000. Commissioners appointed Edward L. Barker and W. Ernest Swarthout as viewers and County Surveyor Albert Karstutter as engineer.

Atchison, Kan.—Resolution has been passed for grading, curbing and paving North Third St.

Lawrence, Kan.—Petition asking for paving of Louisiana St. has been granted by Commissioners. Sixteenth St. has been ordered graded, curbed and paved.

Waltham, Mass.—Orders for rebuilding Main and Moody Sts. at cost of about \$15,000 have been approved.

Escanaba, Mich.—Bond issue of \$30,000 for roads will be offered for sale shortly.

Sault Ste Marie, Mich.—Bye Bros., from Benzie County, who have contract to construct ten miles of Gatesville-DeTour

state trunk road, will commence work at once.

Laurel, Miss.—Ordinances will be introduced for sale of \$15,000 bond issue for establishment of municipal county fair and \$10,000 bond issue for street improvement.

Kansas City, Mo.—County Court has approved specifications of Allen C. Southern, county highway engineer, for macadamizing of Old Lexington road, and instructed engineer to make estimates of cost.

Omaha, Neb.—City Council approved expenditure of \$18,000 for concrete roadways in south part of Miller Park. Concrete will be covered with 2 ins. of granite chips.

Perth Amboy, N. J.—Council has approved ordinance for paving Rector St. with vitrified brick.

Port Dickinson, N. Y.—Taxpayers have voted in favor of purchasing compressed air flusher.

Saratoga Springs, N. Y.—City Council has voted to expend \$27,500 for purpose of improving principal streets of city.

Syracuse, N. Y.—City will resurface pavements at cost of about \$200,000.

Winston-Salem, N. C.—Board has ordered North Trade St. to be paved with permanent pavement.

Fremont, O.—County Commissioners have adopted final resolution for improvement of 6 miles of Fremont-Bowling Green road. Reinforced concrete will be material used and estimated cost is \$93,000.

Sandusky, O.—Contract between city and Indian Refining Co. of New York for 75,000 gallons of oil at 5.24 cts. per gallon, has been approved by Council.

Sandusky, O.—Resolution has been introduced instructing the city manager and solicitor to determine whether city could not get portion of county bridge and road fund.

Blooming Grove, Tex.—Election is recommended to vote again on bond issue for good roads which was defeated at recent election.

Fort Worth, Tex.—Plans being discussed for elimination of grade crossings.

Parkersburg, W. Va.—Ordinance being considered for widening Murdoch Ave.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contract Awarded.)

Greenfield, Ind.—For three-mile stone road in west part of county: *Everett McMahan for \$55,767.

Indianapolis, Ind.—*United Paving & Const. Co., local, for paving 34th St., at \$51,000, and 38th St., at \$64,000.

Indianapolis, Ind.—For road machinery as follows: *Wm. Peck for gas engine at \$280; *Milwaukee Concrete Mixer Co. for mixer at \$1,700; *Jackson Machine Co., for graders, at \$260 and \$135; *J. D. Adams & Co., for scarifier at \$525.

Kokomo, Ind.—All bids for paving Indiana Ave. and Superior St. rejected. Work will be readvertised.

Monticello, Ind.—For road construction as follows: Pettit road, *Thomas Callahan of Rensselaer, for \$11,912.50; Renck road, *John Day, Monticello, \$7,935.40; Ireland road, *O. E. Shafer, of Royal Center, for \$9,499.

Scioto, Ind.—*George M. Gross, La Porte, Ind., for building road at \$4,889.

Shelbyville, Ind.—*Sexton & Bolt for improving Valentine road in Van Buren Twp. at \$7,275.

Shelbyville, Ind.—For building Valentine road in Van Buren township, *Sexton & Bolt for \$7,275.

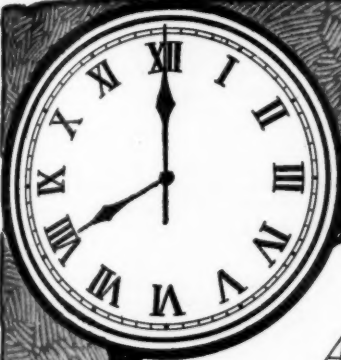
South Bend, Ind.—*Geo. Grosse, La Porte, Ind., at \$32,749, for concrete road in Olive Twp.

Rutherford, N. J.—For supplying road oil: *Logan & Hatherway of Newark, at their bid of 7 1-10 cts. a gallon spread; for furnishing trap rock: *John T. Harrop Co., of Garfield; for doing various concrete and blue stone work during the year: *Oscar Kastner of Carlstadt.

SEWERAGE

Shelbyville, Ind.—Board has ordered construction of drain in Van Buren Twp. William T. Ensoninger will superintend work.

Lawrence, Kan.—Commissioners have ordered construction of sewers in two streets.



TESTS EVERY HOUR DAY AND NIGHT

As an engineering authority recently said:

"The making of Portland Cement requires the **greatest care** and **long experience**. It is a scientific and chemical procedure representing the antithesis of guesswork or slipshod methods."

The ALPHA system of manufacturing is the result of 25 years of experience, during which time ALPHA CEMENT has displaced the best imported Portlands.

The chemist is a man of real authority in every ALPHA plant. He cannot be overruled by men zealous for large or economic output.

The hourly system of tests, beginning with the quarry borings, is followed strictly.

Result: It is impossible for cement that is lacking in binding power to be shipped from an ALPHA plant.

The word "Guaranteed," now stamped on every new ALPHA bag, assures you that the cement will more than meet all standard requirements.

Send for ALPHA Book No. 3, giving valuable information about cement and concrete work.

ALPHA PORTLAND CEMENT COMPANY

General Offices, EASTON, PA.

SALES OFFICES:

Boston	New York
Philadelphia	Pittsburgh
Baltimore	Savannah

ALPHA

THE HOURLY TESTED AND
GUARANTEED PORTLAND

CEMENT





'Prudential'
PORTABLE
GALVANIZED
STEEL
BUILDINGS
ALL SIZES
FOR
ALL PURPOSES

CEMENT STORAGE, BUNK and
TOOL HOUSES, Etc.
ASK FOR CATALOG "D"

C. D. PRUDEN CO., Baltimore, Md.

FOR SALE AT BARGAIN

One No. 0 Austin Trench Machine. Boom to dig 15 ft.; 18 and 24 inch buckets. Gasoline power. Used only 3 months. Inquire, Mathias Stipp, 435 Moir Court, Scranton, Pa.

**FOR SALE
GENERATOR**

Crocker-Wheeler—110 Volt 75 K. W. direct connected to Russell Automatic Engine—lubricating devices, switch-board and instruments. At a bargain. Zelnicker in St. Louis.

FOR SALE

One gas macadam roller. Little used. Low price. Write L. P. Jenkins Company, care of Municipal Journal.

WANTED

One 10-ton Macadam Roller at a bargain. Send lowest cash price and description to—Lannen & Davis, c/o The Municipal Journal.

**TRANSITS AND LEVELS
RENTED OR SOLD
EASY TERMS**

THE ENGINEERING AGENCY, Inc.
53 West Jackson St. Chicago

**CONCRETE RESERVOIR
NOTICE TO BIDDERS**

Wilmington, Del.

Sealed proposals will be received for the City of Wilmington, Del., by The Board of Water Commissioners at their office, Wilmington, Del., until 2 P. M., on Friday, June 2, 1916, for the construction of a 7½ million gallon reservoir to be constructed on a site at Rodney and Eighth Sts. in the said city.

The work includes a covered concrete reservoir, about 250 feet by 270 feet, and to contain a depth of about 16 feet of water, with gate house and piping. A shelter house is to be erected over the reservoir, and a portion of the reservoir roof is to be covered with asphalt paving.

Bids must be accompanied by a certified check in the sum of \$5,000. The time for completion of the work is June 1, 1917.

Copies of the plans and specifications will be ready for distribution on May 19, 1916, and may be obtained from George W. Fuller, Consulting Engineer, 170 Broadway, or from the said Board of Water Commissioners upon deposit of \$50, which will be refunded if the plans and specifications are returned in good order.

The right is reserved to reject any or all bids.

BY ORDER OF BOARD OF WATER
COMMISSIONERS.

Edgar M. Hoopes, Jr., Chief Engineer.

STREET PAVING

DEPARTMENT OF STREETS AND PUBLIC
IMPROVEMENTS

Reading, Penn'a, May 10th, 1916.

Sealed proposals will be received at the office of the City Clerk, Reading, Pa., until 10 A. M., Wednesday, May 24th, 1916, for the construction of paving and appurtenances on various streets in the City of Reading.

APPROXIMATE QUANTITIES OF PAVING

Kind of Paving	Sq. Yds.
Wood Block Paving on Concrete Base...	3,020
Vitrified Block Paving on Concrete Base.	7,370
Asphaltic Paving on Concrete Base	33,700
Resurfacing on Concrete Base with Sheet Asphalt	11,300
Repairs to Sheet Asphalt Paving	8,000
Bituminous Bound Macadam Paving.....	250

Blank forms of proposals, proppsal and contract bonds, plans, specifications and any other information may be obtained at the office of the City Engineer, City Hall, Reading, Pa. A deposit of ten dollars (\$10.00) will be required for plans and specifications taken from the office, which deposit will be remitted to bidders upon return of plans before June 1st, 1916.

Proposals must be endorsed as to the character of paving bid on and addressed to the Superintendent of the Department of Streets and Public Improvements, in care of the City Clerk, Reading, Pa.

The right is reserved to reject any or all bids.

EUGENE I. SANDT,

Superintendent.

EDMUND B. ULRICH,
City Engineer.

WANTED—A Proposition

What proposition have you to offer to a young man of 36 who is not an engineer, yet has accumulated a great deal of knowledge in regard to construction of various classes of pavements, sewers, and public work in general during his 15 years' experience in the Department of Public Works of a large city in Wisconsin. Has a large acquaintance among the contractors and the people in general.

Have you a good, live proposition for a good, live young man? If so, write to JUL. DAMMANN, 393—20th St., Milwaukee, Wis.

Sealed bids will be received for paving East Main Street in the Village of Fayette, Fulton Co., Ohio, up to 12 o'clock noon of May 23rd. Construction concrete, vitrified block or asphalt block.

C. D. HAUSE,
Village Clerk.

Butte, Mont.—Commissioner J. J. Armstrong recommends extensive program for repair of storm sewers in city.

Monroe, N. C.—Extension of compulsory sewer zone has been ordered by the Board of Aldermen, which will take in all business section and larger portion of residential districts.

Beaver, Pa.—Bids will be asked for laying sewers in six streets.

Sumter, S. C.—Extension of sewer connections has been urged.

Beaumont, Tex.—Property owners have petitioned for construction of sewer in Park St.

Corsicana, Tex.—Plans are being discussed for building sewage disposal plant.

**BIDS RECEIVED AND CONTRACTS
AWARDED.**

(*Indicates Contract Awarded.)

Kokomo, Ind.—*Fred Davenport, for 12-inch vitrified tile sewer, at \$1,125. Ben Havens is City Clerk.

Marquette, Mich.—*Charles Pellissier for constructing sewer on Summit St. at 49 cts. per lin. ft.

Binghamton, N. Y.—*C. W. Rose for constructing two sewers at \$1,550 and \$600, respectively.

WATER SUPPLY.

Washington, D. C.—Man in Venezuela desires to receive catalogues and full information from American manufacturers of small water turbines of from 1 to 6 horsepower, small steam turbines of from 1 to 6 horsepower, and small ice machines adaptable to motors of 2 horsepower. References are given (No. 21-109).

Huntington, Ind.—Council contemplates bond issue of \$4,000 for deepening water works well and \$16,900 for ornamental lighting system.

Lawrence, Kan.—Election to vote bonds for purchase of water plant has been postponed until about June 15.

St. Cloud, Minn.—Council has granted petitions for extension of water mains on Tenth Ave. and Tenth St.

Billings, Mont.—Council has acted favorably on petition for installation of water mains in two streets.

Perth Amboy, N. J.—City Engineer Samuel J. Mason was instructed to prepare plans for extension of 30-in. main from the Ernston standpipe to Raritan River.

Binghamton, N. Y.—City considering question of acquiring Rockbottom Dam.

Red Creek, N. Y.—Citizens have voted bond issue of \$30,000 for water works system. Surveys have been made and work will be let shortly.

Columbus, O.—Supt. O'Shaughnessy of water works department has recommended purchase of new pumps to lift water from river to filtration plant. Estimated cost, \$20,000.

Sandusky, O.—Commission has voted to enter into contract for purchase of 242 water meters from Union Meter Co., Wooster, Mass. City will pay \$7 or \$8 and sell them to patrons for \$12.

**BIDS RECEIVED AND CONTRACTS
AWARDED.**

(*Indicates Contract Awarded.)

New Brunswick, N. J.—Lowest bidders for 6,000,000 gallon filter plant were as follows: Roberts Filter Mfg. Co., Darby, Pa., at \$77,520; Utility Const. Co., New Brunswick, N. J., at \$82,825; American Water Softener Co., Philadelphia, Pa., at \$84,241. Asher Atkinson is City Engineer.

New Brunswick, N. J.—Lowest bidders for 40x85 standpipe were as follows: Chicago Bridge & Iron Works, at \$18,730; Memphis Steel Co., Greensburg, Pa., at \$18,760; Tippet & Wood, Phillipsburg, Pa., at \$20,406; Hughes-Foulkrod Co., Philadelphia, Pa., at \$21,870. Asher Atkinson is City Engineer.